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**NEWS IN BRIEF**

**Bonus for council staff**

DIFFICULTIES in recruiting computer staff following the break-up of the Joint London Computer Consortium (JCCL, March 30), of which it was a member, have prompted Bexley Borough Council to offer a "completion bonus" to its permanent computer staff if they stay with the council at least until it begins operations on an IBM 370/138 next March.

"We are understaffed by about seven people," said a council spokesman, "and because of this had to take on contract staff. Our permanent staff will share between £70,000 and £80,000 in bonus payments while the contract staff will cost us about £170,000."

**Good start**

INTRODUCED by Computer Ancillaries in April, the new Mael 5000 multi-terminal micro-computer from Insel of Italy has got off to an excellent start, winning UK orders worth £200,000 in the first two months of marketing.

**Membrain order**

AN ORDER for four of its MB 7700 range test systems has been placed with Membrain by the RAF for its Avionics Repair Centre near Chester. They will be used to test and diagnose a wide range of printed circuit boards automatically.

**GEC picks Trend**

PAPER tape readers worth a total of £21,500 have been ordered from Trend Communications by GEC Computers. The readers are a mixture of 350 and 700 chps models and will be used with GEC 2050 and 4000 series computers.

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**IBM hits at European govt procurement policies**

CRITICISM of European government procurement policies and the principle of single tender contracts, has been voiced by top IBM executives in Paris and Vienna.

M Jacques Lemonnier, the new managing director of IBM France has expressed concern at the slow growth in IBM's public sector business there.

Commenting on the French policy of favouring CII-HB for government business, Lemonnier is quoted in Le Monde as saying: "Today the technical judgments of public service users are perverted in order to obey the directives of the Ministry of Industry. Our engineers cannot understand why the government favours imported machines over machines built in France (a reference to the fact that IBM builds the 370/138, 3031 and 3032 in France, while CII-HB Level 66 machines come from Phoenix or Scotland at present, although they are to be built in France shortly).

"This practice of guaranteeing orders to one company is a complete negation of the principles of free enterprise which the government has been enunciating for several months," he adds.

In Vienna, Kap Kassani, administrative general manager of IBM Europe, made a similar point, although carefully avoiding mention of any specific government.

"In a number of European countries," he said, "we have seen different forms of preferential treatment of so-called national DP manufacturers in procurement decisions for DP equipment."

"We think that these practices are detrimental to all parties concerned, the user of the equipment as well as the protected supplier. We feel strongly that public procurement should award bids on the merits of the individual offers."

"If government support is considered essential, we think it should be offered in the form of subsidies for R&D rather than through guaranteed contracts. The DP industry is technology-driven and future success is possible only through technical leadership."

**A step closer to world viewdata**

WORLDWIDE viewdata has been brought a step nearer by the definition of an X75 protocol for interconnecting X25 packet-switched networks.

An X25 network is the logical medium for transmitting viewdata traffic, and the Post Office is considering use of the forthcoming public packet-switched network for its Prestel viewdata service.

Although not yet formally approved, the network is due to come into service late next year. Delay in seeking approval does not imply any hold-up in implementation of the network.

Proposals from the industry for design of the network have been invited and are due next month, and the Post Office feels that until these have been studied, it is not possible to put up a realistically costed proposal to the board.

It is clear, however, that if the target date of late 1979 is to be met, existing packet-switching technology will have to be used. Among the possibilities are the CP-50 switches used on Transpac, and Telenet Corp's Telenet Processor (CW, July 21, 1977).

The French Transpac network, which was to have begun service this month, is now due to start in October, and is scheduled to offer service from an

ambitious 12 exchanges from day one.

Euronet, which is being built by CEPT, the Conference on European Posts and Telecommunications, on behalf of the EEC, is due to begin service shortly afterwards.

Based on Transpac technology, Euronet includes two additional features. Where on Transpac, all connections are billed as reverse charge calls on the computer being called, Euronet has to bill terminal users, and therefore needs to include facilities to process user identity data. Also, since Euronet is a multi-national network using the facilities of several PTs, there is a need to collect and process data on traf-

fic flows in order to calculate payments to each PT.

Active consideration is being given to making the UK public packet-switched network the medium over which Prestel viewdata subscribers will communicate with the Prestel computers. An experiment to link Prestel terminals in the UK to the West German Bildschirmtext system is planned, and it is hoped that the link can be made via Euronet. The Bildschirmtext system is based on Prestel software and licences bought from the Post Office.

For the public packet-switched service, the Post Office is planning a charge of not more than 0.05 pence per packet, with additional standing charges for connection.

**Racal 52% expansion—but Plessey dogged by misfortune**

YEAR-END results from Racal and Plessey indicate that, while Racal Electronics continues ahead, Plessey still has a long way to go to realise its full potential.

Pre-tax profits at Racal for the year to March 31 were up 52% at £48.8 million, on a turnover up 50% at £183.3 million. Data Communication, including the revitalised Racal-Milgo, was a major contributor, but tactical military radio equipment led.

While everything Racal touches seems to turn to gold, Plessey seems dogged by misfortune. In recent years, cut-backs in Post Office orders for telecommunications equipment have been a major setback. This time the Garrard turntable subsidiary turned in a £5.2 million loss which reduced a potential 20% improvement in pre-tax profits to a meagre 6.3%.

Ferranti's figures, out this week, are expected to show a strong profit advance, and next week the company is to apply for listing of its shares on the Stock Exchange, following which the NEB will reduce its stake from 82.5% to 50%.

**'Draw more on govt research'**

THE Parliamentary Under-Secretary of State at the Department of Industry, Leslie Hunkfield, has called for industry to draw more on the resources of government research establishments.

Speaking last Friday at the launching of the first review of the DoI's six research establishments, Hunkfield said: "The technologies developed in the laboratories must be transferred to industry... by staff working hand in hand at the lab or firm or by laboratory specialists joining companies as permanent members of their staff."

Commenting on Hunkfield's remarks, the National Physical Laboratory said that it was already involved with industry in many projects. One example quoted was the design of a multi-processor computer being developed with Selen (see page 3).

Research Establishments Review 1978 is available from the Department of Industry Library, Abell House, John Islip Street, London, SW11 1JL. Tel. 01 21 1221.

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**'God's gift to services industry'**

MICROS are God's gift to the services industry. So declared CAP chairman Alex d'Agapeyeff speaking at the First World Computing Services Congress in Barcelona last week. He was hitting back at many delegates who had said that they were worried about the spread of micros.

"The key to computing now and in the future is software," said d'Agapeyeff, pointing out the enormous business opportunities for software houses that there would be when everyone had his own computer.

Other speakers expressed the view that there would be plenty of demand for services which bureaux could provide, particularly in back-up and large-scale storage, while big discs remained out of many customers' price range.

**Third World theme**

THE use of computers in agricultural planning for Third World countries is the theme of next Wednesday's meeting of the BCS Specialist Group for developing countries. The meeting will be held at the London School of Economics, starting at 6pm.

Amdahl's MVS/SE Assist is the only major software product so far introduced by the company, and is claimed to improve throughput by about 12%, and runs on all 470 models.

IBM charges \$1,250 a month in the US, £951.30 in the UK, for MVS/SE, and Amdahl users will have to pay this rental fee to IBM in addition to the £250 a month to Amdahl if they want to run MVS/SE on 470s.

The availability of the MVS/SE Assist software raises the possibility that Amdahl could offer it to IBM 370/138 and 168 users as an alternative to the Extended Feature for MVS/SE. To pay Amdahl £250 a month looks an attractive alternative to paying IBM between £9,400 and £47,000 for the Extended Feature.

Amdahl says that MVS/SE Assist has not been tested on a 158 or 168, and that there are no current plans to offer it to IBM users.

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**Software answer to Extended Facility**

THE answer from Amdahl to IBM's Extended Facility for the MVS operating system has been announced for delivery in October. Where IBM's Extended Facility is implemented in firmware (CW, May 4), Amdahl's product, called MVS/SE Assist, is software.

The Extended Facility, which is standard on the 3030 series and an option on the 370/168 and 158, enables users to run an enhanced version of MVS called MVS/SE, for Systems Extension.

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THE highly successful seminar "IBM - the next five years" held last March and organised by Infotech is to be run again from September 11/13. The subjects will be similar but most of the speakers will be different. The venue is the Greenwood Theatre, London SE1. The fee is £310, with a 5% discount on bookings made before July 14.

**Home micro**

RESULTS of market surveys will allow Hitachi to decide how and when to put its new home microcomputer on the market. First shown at the Tokyo Good Living Show, last May, the system is designed to interface directly with a TV, and is intended for controlling central heating systems, housekeeping budgeting and daily menu preparation.

**Fight for control**

AFTER two months of indecision, Northern Telecom of Canada has decided to fight US aerospace manufacturer McDonnell Douglas for control of Data 100 of Minneapolis. The Canadian firm, which already has 31% of Data 100, is offering \$18.25 per share for the remainder. McDonnell Douglas is bidding \$17.50 per share or \$20.50 in bonds, convertible some time in the future (CW, May 25).

**Automatic fares**

IF permission is granted by the GLC, London Transport will soon be inviting tenders from outside companies for the development of its £55 million automatic fare collection system (CW, August 11, 1977). London Transport hopes that the new system will reduce the £2 million annual loss of revenue that stems from fraud by users of the underground railways.

**Briefing Threshold future in doubt**

THE National Computing Centre's Threshold training scheme for young people may not continue after May, 1979 when the special measures under which the Manpower Service Commission funds it, expire. Threshold does not fit in with the MSC's current Young Opportunities Programme because its courses are too long and at the wrong academic level.

The MSC pointed out that after the first two years of Threshold it was intended that industry would take on the cost of the scheme. The NCC has submitted an amended syllabus which is being considered by the MSC.

**Into China**

WITH orders from the Peking University of Science and Technology for an 1100/11 and from the Peking Document Service for an 1100/12, Univac has broken into the Chinese market. The orders total \$6 million and follow an order to IBM for a 370/138 for a turbo-fan plant (CW, June 1). All three will need CCCom approval.

**Seminar repeat**

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**GEC walk-out over sacked ops**

A STRIKE took place this week at the GEC Stoke, Coventry plant in support of 18 operators at the site who were sacked on Monday, following four months of disputes with the company.

All ASTMS members at the plant walked out after a mass meeting on Tuesday morning, expecting to return tomorrow (Friday).

A meeting of AUEW/TASS members late on Tuesday afternoon was also expected to support a two-day walk-out, although the result of this meeting was not known at the time of going to press.

The company sacked the operators after giving them the option of reporting for work at 9.30 am on Monday, July 3, or being dismissed.

**US error relegates ICL in 'league table'**

AN error in a major US survey has seriously downgraded ICL's position in a "league table" of computer companies.

The survey, conducted by Arthur D. Little Inc and published in the June issue of the American monthly publication Datamation, attributed to ICL a turnover of \$233 million in its 1977 financial year and bottom place in a list of seven non-US companies, behind Fujitsu, CII-HB, Hitachi, Siemens, Nippon Electric and Nixdorf (in that order).

The report does not reveal the exchange rate used, but \$233 million would be, at most, about £130 million. In fact, ICL's turnover for the year ended September 30, 1977, was £418 million, which is over \$750 million at the current rate of exchange and close to the \$765 million attributed to second place CII-HB.

In the survey of US companies, Texas Instruments and Amdahl showed impressive gains over the previous year's tables.

Full report, page 8.

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**Model welcome for first 2950**

WHEN ICL delivered the first 2950 on schedule to turn and swimwear manufacturer Berlei (UK), model Juliette was at the company's Slough, Bucks, head office to welcome the machine. She was wearing one of the latest Berlei developments, a swimsuit called Secreta. On a different software front, programs on the 1 Mbyte, £380,000 2950 will be used to develop online systems under VME/K and some 1,000 programs will be run under DME/3 emulation.

Berlei factories at Merthyr Tydfil and Portsmouth will be linked to the system by 7602 processors and direct links are also planned from the company's five other UK plants.

ICL is now delivering 2950s at a rate of two a week, with eight of the first 10 going overseas.

**Halifax cash card threat to major banks**

IN a move which could seriously challenge the competitive position of the major clearing banks, the Halifax Building Society is evaluating an IBM online cash dispenser at its head office, in Halifax.

The society is the UK's largest, with 952,008 borrowers' accounts, over five million investor accounts and 360 branches. The planned pilot trial is still in the development stage, but the society intends to start an in-house service for staff use in the autumn. If the results of this are satisfactory, it will consider a pilot service to customers in a few branches.

If a cash dispensing service is offered it is likely to be linked to a new kind of account bearing a very low rate of interest, but no firm decision has been taken.

The clearing banks are already suffering from the fact that building societies are open on Saturday mornings when all the banks are closed, and the advent of cash dispensers from building societies could be another blow.

As soon as one society introduces dispensers, others are likely to follow and some societies, such as the Britannia, have designed their networks from the ground up to be capable of adding cash dispensers if and when they are needed (CW, June 1, 1976).

**PoS preview in North**

THE Halifax is unique among building societies in that it already offers a small-scale deposit cheque facility, mainly for staff members. However, the special accounts are also available to wives of staff members and to former staff, and there are about 10,000 such accounts altogether. It is on these accounts that the dispenser will be tested initially.

The dispenser under trial is

Turn to page 8

**Supermarket point-of-sale systems from ICL are now in operation at several locations in the North of England, according to ICL's retail systems sales manager, Mike Pollitt. As yet unannounced as standard ICL products, the systems operate online with a back office computer and provide facilities such as price lookup.**

Systems Ltd is a rapidly growing UK computer manufacturing company. They are now offering a range of services and training to their customers.

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**Computer Weekly's Inside News**

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**Logica buy out US back**

TO establish European-owned Logica is to buy backer, the Planning Corp of California. The deal, which is agreed in principle, will see Logica staff share have 51% and the enterprise Board be 30%.

Other European have been invited for the remainder of the share, but it is expected that there will be Dutch involvement in the venture. The company is a subsidiary of the PRC at present, but is now a public company.

**Plea to Kren**

READERS of Computer Weekly are invited to join a campaign to support the scientist Anatoli who is due to face treason in a Moscow court.

In this week's issue, we have a special appeal for support of the scientist Anatoli who is due to face treason in a Moscow court.

He is a brilliant scientist who has made many contributions to the field of computer science. He is now facing a charge of treason in a Moscow court.

We are asking you to write to the court and urge them to set him free. We are asking you to write to the court and urge them to set him free.

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# MICHIE'S PRIVATEVIEW

## A telegram to Leonid Brezhnev



THE 30-year-old Soviet Scientist Anatoly Scharansky is due shortly to stand trial in Moscow on a charge of treason. Before his arrest he was an active member of the Helsinki Agreement monitoring group. This group investigates the degree of compliance by the Soviet authorities with the Agreement's provisions on human rights, and takes particular interest in the case of Soviet Jews wishing to emigrate to Israel. From time to time the group circulate reports of their findings. It is this to which the Soviet government takes special exception.

Scharansky is Jewish. He is also a computer scientist. Last summer the ACM leadership protested publicly against his arrest (CW, August 18, 1977). Unfortunately these protests, instead of urging computer scientists worldwide to direct appeals to the Soviet political and legal authorities, called on them to rupture relations with their Russian scientific opposite numbers, to boycott conferences on Russian soil, to refuse to accept Russian scientific visitors, and so on.

This recommendation in my opinion was and is a tragic error. If the aim is to bring encouragement to Soviet scientists concerned about human rights, then this way of showing displeasure with the actions of their government is seriously counter-productive. As a way of influencing those actions it is at best totally ineffective.

There is doubtless some idea in mind that such measures may somehow goad or shame

Soviet scientists into themselves taking the matter up with their own governmental authorities, and that Brezhnev is more likely to take note of this indirect pathway than he would of more direct pressures. On the basis of numerous visits to various parts of the Soviet Union over the past 22 years, during which period I have also played host to a succession of Soviet visitors to my own laboratory, I can assert that such an idea is misconceived. It would after all be absurd if, shall we say, some Soviet academics, upset at recent reports of British torture of suspects in Ireland, were to break off their relations with the Royal Society, The Fellows of the Society, and other British scientists, would be inclined to feel that foreign scientists should either mind their own business or should address their protests to the Home Secretary, the Prime Minister, or other relevant person or government office.

Why do our scientists and computer people imagine that these particular principles work any differently in the reverse direction? The assumption that they do is contradicted by numerous conversations I have had over the years with Russians of every hue in the spectrum.

The desire to hit out at fellow scientists and technologists, however well motivated, saddens and alarms me. I detect here seeds of that mindless hysteria which ends up injuring the very cause that it purports to champion. Let us not forget the cold-shouldering of Einstein by the British

scientific establishment in the early 1920s. Why was he denied acceptance? Because he was German, and hence associated in people's minds with memories of the Kaiser's atrocities.

Anatoly Scharansky did his Master's thesis on the computer representation of chess and game knowledge. As I have on occasion pointed out to Soviet artificial intelligence scientists, he is therefore my colleague, my brother.

In invite all who feel an identification either with this narrow technical concern, or with the broader community of scientists and engineers everywhere into a single fraternity, to add their signatures to mine on the following telegram to Leonid Brezhnev, and/or to send their own message (preferably "and").

Brezhnev, Kramlin, Red Square, Moscow, USSR.—We British computer professionals express our concern at the forthcoming trial of Anatoly Scharansky and believe advance of science and human culture to be inseparable from equitable and open judicial practice. We accordingly urge that observers from the international scientific and computing community be invited to attend the judicial proceedings.—Donald Michie.

Editor's note. Readers wishing to add their names to the above telegram should write a personally signed letter to the Editor, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU, including a verifiable address.

## SOFTWARE FILE-1

# 'Pursue patents in Congress'—court

A JUDGE in the US Supreme Court has indicated that proponents of software patentability should pursue the matter with Congress rather than in the courts. The recommendation was made after the Court had ruled against patentability in the Dale Flook case (Software File, May 18).

Flook's system, the subject of the case, is an improved method for monitoring permissible levels of heat, pressure, and other variables during

such manufacturing processes as petroleum refining.

Voting by six to three, the Supreme Court held that the disputed program could not be patented under current patent law since its only novel feature was a mathematical formula.

The decision rested on a long-established precedent that abstract intellectual principles, such as laws of nature or mathematical algorithms, are not patentable.

Associate Justice John Paul Stevens noted that a process did not become unpatentable simply because it made use of such a formula. He insisted, however, that the process itself must be new or useful.

In this case, he said, the computer program at issue was not an "inventive application" because it employed well-established technology with the mathematical formula as its only new feature.

Justice Stevens went on to emphasize that the decision should not be interpreted as establishing that patent protection for software was undesirable. The appropriate scope for such protection was, however, a policy decision best left to Congress.

The Supreme Court's majority decision overturned the previous finding of the US Court of Customs and Patent Appeals. This court had ruled that the subject matter of the program was patentable.

The dissenting judges, complaining that the decision struck a damaging blow at basic principles of patent law, said that criteria of novelty and inventiveness had been introduced incorrectly.

The degree of innovation should be considered only when deciding whether to actually issue a patent, they said. Although a patent might well be ultimately denied, Flook's process in their view clearly met the standards set for subject matter patentability under the current law.

## Store, retrieve system for alphabetically indexed data is launched in UK

NEWLY-INTRODUCED in the UK is a system for storing and retrieving alphabetically indexed data. The On-Line Alpha System, which operates under all versions of IBM's DOS and OS, originates from Insurance Systems of America Inc and is available here from Lonsdale Systems.

The software is particularly well suited to applications which need to access large files or databases using an individual's name as the search key.

Typical users in this mode would include banks, insurance companies, public utilities, and local government departments, which face the problem of having to make inquiries when the customer or account holder does not know his customer or account number.

On-Line Alpha provides operators with flexible facilities for master file searching. A search can, for example, be initiated with as little as last name only — or part of the last name — and the system will return all potential matches.

Because it uses automatic phonetic encoding, the system is tolerant of spelling mistakes: a search on the basis of an incomplete key will also return most

sound-alike names. On the other hand, where complete information is available, secondary identifiers such as date of birth can be used to make an immediate "hit" very likely.

Updatable both in batch and online mode, On-Line Alpha can be implemented either as a stand-alone system or as a subsidiary index to existing master files.

In the latter mode, records would contain a logical pointer into the main application files. The system provides user exits through which such linked records can be accessed.

Written in assembler and supporting QISAM, BISAM, BISM, BSAM, and QSAM, the software is said to execute in a 32K partition under any TP monitor. It will sell in the UK for £21,000 providing a 20-year licence.

Lonsdale is the UK subsidiary of SDI Associates of Toronto, a major Canadian computer services company. The company was formally incorporated in the UK earlier this year, following four years' operation as an SDI branch office.

The company is based at Prudential House, Wellesley Road, Croydon. Tel: 01-481-3021.

## SOFTWARE FILE-2

### SOFT BITS

## Multi-tasking capability

A NEED to process more than one task at a time is said by Allied Industrial Services to have been the key factor in its decision to replace Informatic's small Minicom TP monitor with the Westinghouse system, West.

The company, a division of the Initial Services Group, has installed West on its 256K IBM 360/40 in Bradford, West, which now has 40 European users and 400 worldwide, offers a multi-tasking capability in contrast to Minicom's single-tasking mechanism.

A SOFTWARE development laboratory, employing about 50 staff, has been set up in California by Mohawk Data Sciences Corp. It will concentrate on developing software enhancements for the MDS Series 21.

A RELEASE date of July for the VME/K Basic compiler was confirmed at the last meeting of the VME/K user group. The software was developed by Kent University under contract from ICL.

A TALK on Concurrent Pascal and its use in the NPL's multi-Microprocessor Demos project (CW, June 29) will be given at the next meeting of the BCS Software Engineering group. An all-day meeting to be held on July 13 at Birkbeck College, it will also include discussions of system programming in Pascal-Plus and the use of the MicroSim development system.

LATEST customer for Time Utilising Business Systems' payroll package is Contact Lenses (Manufacturing) Ltd of London. The company runs the software on a DEC Datasystem 310.

CONTRACTS worth £4 million have been received for RTZ Computer Services' fixed asset system Fascia since the release of the Mark II version. Now incorporating facilities for inflation accounting according to the Hyde guidelines, the system has over 60 users.

EXTENSIONS to the user interface are the major feature of the latest version of ADR's Roscoe, marketed in the UK by CAP-CPP. Enhancements include an extended 3270 screen handler, offering key-controlled browsing, and a complementary screen position pointer which dispenses with the need for absolute sequence numbers during file maintenance.

TWO new modules have been added by Safe Computing to its SaFes production control package for ICL System 10 users (CW, October 6, 1977). The modules, for Extended Requirements Planning and Work In Progress, provide the facility for more efficient control of material and resources.

## Time-saving in Panvalet update

THE latest release of Panvalet, Pansophic's source program management system for IBM 360/370 users, includes a number of new time-saving and security features. Version 10 also extends support to 3350 DASD units, in both DOS and OS versions of the software.

Heading the list of enhancements is the "H" command, which enables sections of code to be interchanged between Panvalet library members. The programmer can thus move routines without having to punch them out.

Also designed to save the operators' time is a new facility for selective backup or transfer of members. Using this facility, a protection file of

## Accounting packs for TA 1000s launched

A RANGE of applications packages has been released by Adler Business Systems for the widely installed TA 1000 business system. Developed in the UK, the software library, Absal, provides initial packages in the areas of sales ledger, purchase ledger, and payroll.

Sales ledger processing, invoice production, and stock recording are combined in an integrated system called Assist — Adler System for Sales ledger Invoice production

and Stock. Claimed to feature ease and flexibility of operation, the software also includes ancillary and management reporting functions.

The second package, Panacea, offers facilities for the control and management of the purchase ledger, and cash. The suite is rounded off with Help, a disc payroll system capable of handling hourly, weekly and monthly payrolls.

All the packages are designed for operation on the standard TA 1000 configuration including two floppy disc drives and one alpha-numeric console keyboard.

The company is at present developing systems for VDU use and also plans to offer inventory management, estate management, and production costing and control systems in the near future.

# World rights for Series 1 Basic sold

A COMPUTER services company in Kuwait has acquired worldwide rights outside North America to the only Basic Interpreter so far developed for IBM's Series 1.

The software, Basic/1, was developed by Grand Computing Enterprises of Birmingham, Alabama (Software File, February 16) and was first released last August. The company has just completed an agreement assigning all rights to Gulf Computing Systems, in Kuwait, and Data Systems Inc, in Denver, Colorado.

A spokesman for DSI said that his firm had taken over support of GCE's existing customers in the US, numbering around 15, and was in the process of launching a US marketing campaign. Future development of the system would be conducted

jointly by DSI and Gulf Computing.

Current users were predominantly commercial, he noted, but the educational sector had shown considerable interest and already had at least one user.

Basic/1, which includes its own operating system, is an extended version of the language, said to be roughly comparable with that provided by IBM on 5100 systems. A shareable interpreter, it can support up to twelve concurrent users on a 64K system.

The software is currently available in three versions: a single-user diskette version; a single-user version supporting both disc and diskette; and a multi-user version, also supporting both media.

## Chinks in ICL's TP deal found for Cortez

THE marketing agreement between ICL and Telecom, which gave the former worldwide rights to TP8 (Software File, October 8, 1977), has not excluded from the market other software houses with TP monitors for 2803/2804 systems.

The latest evidence comes from Zeus-Hermes, which has signed a contract with ICL (New Zealand) to cover marketing of Cortez-Plus and Cadis in New Zealand and Fiji. Effective from March 1, the agreement has already resulted in the sale of Cortez-Plus to an ICL customer in Auckland.

Mike Punter, managing director of Zeus-Hermes, said that despite the agreement with Telecom, TP8 by no means appeared to have been adopted as an exclusive standard. "We still prepare joint propo-

sals with ICL and ICL salesmen, both in Europe and the UK, are continuing to offer Cortez. With the exception of Australia, where ICL could not take Cortez officially, we have not suffered at all from the company's agreement to market TP8."

Cortez, which also runs on 1800 and 2800 DME machines, originated from a software house in Australia (CW, December 11, 1978) but has been significantly enhanced by Zeus-Hermes, notably with the introduction of multi-threading (CW, September 22, 1977).

Cadis, an entry-level TP package for 2803/2804 users, was introduced by the company earlier this year (Software File, February 23) as a low-cost alternative for those going online for the first time.

## Routing, scheduling system

A VEHICLE routing and scheduling package said to overcome the limitations on daily trip planning usually imposed by other similar systems has been developed by Deltran Analysis, of Cheshire, Cheshire. Called Trucks, it has been installed by CDC Data Services.

Features of the package include the ability to model road type and congestion, to limit specific goods to set vehicle

types, and to prohibit the allocation of incompatible loads. The system can also handle priority goods, limited access locations, and variable time and distance constraints.

Designed to enable cost minimisation according to user-supplied parameters, the software at the moment caters for urban and interurban networks in the UK and Eire, but is currently being extended.

## IMSL's Fortran on PDP-11s

DEMAND from existing subscribers has prompted International Mathematical and Statistical Libraries Inc to implement its Fortran subroutine library for Digital Equipment's PDP-11 minicomputer.

Consisting of nearly 400 function sub-programs in the areas of mathematics and statistics, the library was validated under DEC's Fortran IV and Fortran IV Plus compilers. Typical memory requirements are said to be 32K.

The PDP-11 version is the second IMSL implementation for a minicomputer. Last year, the library was made available for the Data General Eclipse series (CW, October 6, 1977).

IMSL's UK rival, the Numerical Algorithms Group, has also recently implemented its library on the PDP-11, as well as on a number of other minicomputers.

Available from IMSL headquarters in Houston, Texas, the software carries an annual subscription charge of \$1,220.

## Prosper update from Dataskil

THE latest release of ICL Dataskil's modelling system Prosper contains new facilities as well as extending support to online users on ICL 1800, 3903/2904, and 2900 DME machines. Prosper+ in particular co-

centrates on the requirements of financial planners, with tools in the areas of budgeting, forecasting, and costing. VDU+ provides development aids for the online user, designed to speed the construction of models.

## Computer Marketing

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All prices exclusive of VAT and one off and user manual available  
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## PROGRAMMER NOTES

LAST week's Programmer Notes contained the start of a Do-It-Yourself Input/output library article. This episode continues the OPEN statement format, so it is best read in conjunction with last week's Notes.

It is usually possible to create files with varied READ-WRITE attributes. Programmers should be encouraged to explore the possibilities of limited READ and WRITE account names being used, rather than a blanketing NONE or ALL.

Expiry dates should only be present when a new file is being created and should conform to installation requirements.

Possible extensions to the OPEN and CLOSE routines include parameters corresponding to the unit number and status flag. This type of command would use any defaults or previously introduced file attributes, but remember "insufficient information" is a valid error message following a system request in those conditions. A DESTROY file routine could be incorporated as a secondary entry point to the CLOSE ROUTINE.

It is a good idea to split the status-flag value into several categories, to make for easier analysis. eg 103 could mean an illegal third character in the file name, 204 an illegal fourth

## Bug-free library can give greater control of I/O

character in the password, 1 file is already OPEN, 2 file does not exist, 3 conflict of READ/WRITE privileges etc.

Record handling routines can be broadly divided into READ, WRITE, SEARCH or POSITION and DELETE. Simplistic versions of the argument lists would be needed for sequential access and a slightly more complex version for random files. But keyed files are becoming more popular and it is on these that the Programmer Notes will concentrate.

A suggested READ statement would have the format READ (unit number, key, buffer, length of record, status/direction). The last parameter is optional, and the unit number is self explanatory. The "key" argument needs careful implementation. To insist on a key of the form "B203C1F1P" meaning a three byte key of "AD" is ludicrous. This may mean a KEYMAKE routine is required for the library. Increasing tendencies towards major and minor keys could mean the READ and WRITE routines should recognise the differences.

In certain cases a file may have an associated maximum key value, possibly set up at the opening, or as a system

standard, so the key should be checked. A different form of the READ statement handles sequential reads on a keyed file and in this case returns the key.

Buffer and length are self explanatory, although it is good practice to encourage programmers to use an explicit buffer request. Although length can be a physical present, the parameter should be returned with the actual value, after the read.

Status could include: non-existent major/minor keys; loss of data; end-of-file; null file; file not open/non-existent. The latter may be overcome by performing an implicit OPEN.

The optional direction parameter would be used with the sequential READ on a keyed file and has the values forwards or backwards. Forwards is also the default.

The WRITE routine is the same as READ, only a key must always be supplied, and the "overwrite" parameter can be used. Overwrite is a good security measure. If an identifier key to the one being written exists, the routine either automatically overwrites the record, or reports the fact via the

status flag. The record POSITION and DELETE routines are simpler, needing only the unit number, key and status flag. Implementers should delve into their system file handling to see whether a read of a non-existent key will cause the next read to be made at the key logically after the non-existent key or at an arbitrary point.

A bug-free and efficient implementation of the library, suitably annotated and enhanced; will offer applications programmers more control over their input and output and the end-user an easier means of communication with the dreaded computer.

## Puzzler

THIS week's alphabetic is not only "true" but also the widest ever Seventy-seven is of course an odd number, and all ten digits are involved. See Page 45 for solution.

SEVENTYTHREE  
TWO  
ONE  
ONE  
SEVENTYSEVEN

# Sicob PARIS

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## PEOPLE

### Multiple appointments made at Compeda

TEN appointments have been announced by NRDC subsidiary Compeda, which markets high technology software systems for engineering and CAD applications.

Technical manager responsible for industrial and mechanical engineering is John Smith, formerly with the multinational SKF Engineering in the Netherlands, as senior engineer for manufacturing processes.

Mike Bean, previously chief industrial engineer with Taylor Instruments, joins John Smith's team as a salesman, and John Preat becomes a salesman for the Plant Design Management System, PDMS. Until recently he was commercial sales manager with Warren Point.

Formerly a project engineer with AERE, Harwell, where he was responsible for introducing and implementing PDMS, Chris Chaney joins Compeda as a development engineer on the system.

Project manager of Compeda's Gaelic design system is Michael Watts, who as director of synergy logistics at Synergy Dynamics was in charge of software maintenance, development and testing. John Cookson, previously a marketing executive with Ferranti Cetec Graphics, has become senior technical sales consultant for Gaelic.

Recently appointed systems programmers are: Ken Loosenmore, who as a research associate at Edinburgh University worked with Gaelic and designed one of Britain's first computer-controlled digital music synthesizers; Alex Tweedly, from Marconi Space and Defence Systems where he was a system and user support programmer; and Andy Turner, previously a senior analyst/programmer with the Institution of Electrical Engineers.

After four years as principal author with Plessey Radar, Nair Vasudevan joins Compeda as principal technical writer.

Jim Coe has joined AMI Microsystems as manager of the memory product marketing department, from Intel, where he was manager of international microcomputer marketing.

Arnold Cender has joined Logabux as a systems analyst after holding similar positions with PDM Computer Services and Adler.

David Dove has become managing director of Atlantic Lensing Ltd, formerly he was UK country manager for ICL UK.

Alan Bates, formerly deputy group managing director of Hoskyns Group, has become operations director of Audits of Great Britain Ltd.

Peter Bell has left ICL, where he was regional manager, field engineering for Central London, to join Systime as UK field operations manager.

David Jardine has joined CMC as a senior systems analyst from Lucas Aerospace where he was a systems section leader. Barbara Butler also joins CMC as a senior systems analyst; most recently she held the same job with Rank Xerox.

David O'Toole, a founder member and recently regional director of CMC, has joined DEC International as marketing director.

Peter Turner, formerly an IDMS database consultant with ICL, has been appointed systems consultant with the software services division of Safe Computing.

Keith Oliver becomes a vice-president of Booz Allen and Hamilton, based in the London office. Previously he was a consultant with Business Operations Research.

### Redifon opens Hull office

A SALES office recently opened by Redifon Computers to serve York, Shire and Humberside will be managed by territory manager Gary O'Nions. The address is Wassand Street, Hull, North Humberside HU3 4AL, and the telephone number (0482) 26714.

New appointments at Redifon are those of Les Fettel, formerly a senior sales executive with Honeywell, as senior territory manager for central accounts South, and Steve Gill as London branch manager, previously district manager (manufacturing) with ICL.

### Soccer

#### Summer Computer League

IN Division IV, the team from Staffs has changed its name to Targa and will be referred to as such from now on.

Results  
Division I  
Datscane 4, Rank Xerox 4

Division II  
ICL 2, John Lewis 2  
Datscane (City) 4, Lambeth 3

Division III  
Datscane (WE) 2, Victoria 1  
Victoria 3, 3M 5

Division IV  
Wellorax 3, Computer Weekly 5  
Bund DS 5, Targa 4

Division V  
Sherrwood 5, Allen 1  
CDC 6, Jadpu B 1

### Northern 5-a-side

Quadrant beat ICI (CMS) 5-2 in a replay of the final of the Northern 5-a-side tournament played at the Knutsford Sports Centre.

**JULY 10-14**  
Current problems and methods in partial differential equations (Four Summer Schools). Liverpool and Manchester Universities. Department of Mathematics, University of Manchester.

**JULY 12**  
Meeting: CMC Users' Association (CMAAC), Norfolk County Council, Norwich, 10.30. Details: Maidenhead 28525.

**JULY 13**  
Meeting: BCS Software Engineering Group, Beckwith College, London WC2.

**JULY 18-20**  
Artificial Intelligence Conference, AISA/GI, Hamburg. Details: Derek Slocum, Leeds 21751, ext 7204.

**JULY 18-20**  
Local authoring group meeting 16th, Birmingham University.

**JULY 20**  
Southern Group meeting: ICI Data Entry Users' Group, HAV Ltd, Basildon, 11.00.

**AUGUST 6-8**  
Computers, communications and technology transfer, Jerusalem Conference.

**Information Technology Information Processing Association of Israel (ITIE) Jerusalem.**

**AUGUST 21-24**  
Operational data security workshop Operational Data Security Corp. City University, London EC1. Register August 16. 01-253 4799, ext 347.

**AUGUST 21-25**  
Systemics and systems fourth international Congress World Organisation of General Systems and Cybernetics, Amsterdam. Details: Dr J. Rose, College of Technology, Blackburn, tel 0534 64321.

**AUGUST 22-26**  
Conference on parallel processing IEEE Computer Society/Wayne State University, Ballabe, Michigan, USA.

**AUGUST 22-26**  
Sigsbee 7th, 10th conference on computer graphics and interactive technology. Association for Computing Machinery, Atlanta, Georgia, USA.

**AUGUST 25-26 SEPTEMBER 1**  
Eighty Australia Computer Conference, Australian Computer Society, Canberra.

## COMPUTERS AND THE ACCOUNTANT

# Bored invoice clerks 'soon thing of past'

By Paul Rayner

IT has been said that the purpose of any business is the production of invoices; for businesses only make or supply things in order to get paid; and few customers will pay without first receiving a clear and comprehensive invoice.

A speedy and accurate invoicing system is, therefore, essential to the success of any business. Speed is important in avoiding cash-flow problems. For the sooner the invoice is issued, the sooner the customer will pay.

Accuracy is necessary in order to prevent disagreements and disputes which may delay payment and lose customer goodwill.

Producing invoices manually

or by accounting machine is an exacting and tedious task. Product prices must be looked up, discount structures checked, extensions verified, VAT and sundry charges calculated and the totals posted to the sales ledger. This must be done to a very tight timetable.

At first sight the invoicing department is a prime candidate for computerisation. Yet many companies have repeatedly decided against this.

With all its failings, a manual system is flexible and in today's highly competitive market place the ability to change pricing policies and discount structures is essential to success.

It is this need for flexibility that has, until now, prevented

many companies from fully automating their invoicing department. Even a simple invoicing system requires a big investment in programmer time and once the programs are written it requires a further investment to change them.

The marketing department of the company is thus "locked-in" to a set of pricing policies and discount structures that may no longer be suitable.

Careful design and clever programming can make the programs flexible enough to meet the likely fluctuations in marketing policy. However, many computer departments have neither the time nor the resources for such sophisticated work.

An obvious solution for the user who wants a first rate system, is to buy a ready-made and fully tested program package. A choice of packages is now available, with a wide range of prices and facilities. Some are merely in-house systems which the writers think are good enough to sell to others.

Some, however, have been written by reputable software houses with the specific aim of being flexible, general-purpose packages usable by a wide variety of companies.

There are certain basic requirements that any packaged invoicing system must fulfil, it should: 1. Produce invoices and credit notes; 2. Handle VAT and discounts; 3. Allow the processing of non-stock items and "one-off" customers; 4. Print a register of all invoices and credit notes produced; and 5. Print out control information so that auditors and others can verify that everything has worked correctly.

In addition the invoicing system will need to pass details of all invoices and credit notes over to the sales ledger. This "passing across" should be automatic. Ideally the customer information common to both systems should be held on one set of files.

A complete interface of this sort saves manual work, ensures that the two systems always balance and avoids inconsistencies with customer names and addresses.

The invoicing system should also interface with the stock system. This is essential to access product descriptions, prices, units of issue, etc. Again information common to both

systems should be held on one set of files. Obviously it would be foolish to have two product master files — one for invoicing and one for the stock system.

Finally, the system should ease the task of both the financial and management accountants by producing VAT reports and sales analyses. This information should all be available within the system and it should be made available in suitably laid out form to all those who need to use it.

The simplified diagram on the left shows the system flow of a typical package, namely the NOR-INV package developed by Northern Software Consultants.

1. Details of despatches and returns from customers are entered as input. This can be either from manually prepared input or can be computer records transferred from a sales order processing system;

2. The manually prepared input is checked for validity. This involves looking up product and customer codes on the product and customer master files. The system also allows input relating to non-stock items and non-standard customers;

3. Details of stock-items are picked up from the product master file. Information picked up includes descriptions, prices, discount and VAT codes;

4. Names, addresses and discount codes for standard customers are then picked up from the customer master file;

5. With all the necessary information now available, the user's invoices and credit notes can be printed together with an invoice credit note register; and

6. The analysis routines allow the user to get management reports such as sales analyses and audit reports.

The real problem with invoicing comes with the actual invoice document itself. Whilst certain information must, by law, appear there is no such thing as a "standard" invoice. Instead every business has a different layout.

On the whole, these differences reflect the diverse characteristics of the organisations issuing them. For example, an invoice from a flour miller will have to contain information different from that contained on an invoice sent by a garage.

An even more varied item on invoices is the pricing and dis-

Due to the success of early accounting systems, accountants have realised that computers can give management information that could only be obtained previously at great cost and effort.

However, while the earlier implementations were few and well defined, many of the present ones require the skill and ingenuity of systems designers to be further extended both in-house and by the software houses.

In the first article in this feature Paul Rayner, European Marketing Manager of Northern Software Consultants, urges that new systems

counting structures to be used. For example, there are many different types of discount: product discount, eg 10% discount in this item; customer discount, eg 15% discount for favoured customers; quantity discount, eg 10% lower unit price when more than 50 delivered; invoice value discount, eg 5% discount on all invoices worth more than £100.00; settlement discount, eg 3% of total to be paid, if payment is received within seven days; and, special discount, eg a special reduction below list price negotiated by the salesman so as to get the order in the first place.

In a business any or all of these discounts may be used in a complex inter-relating structure. For example, certain customers may get discounts on some product lines, but not on others.

The actual structure used usually reflects the trade custom of the industry, combined with the company's current marketing policy.

Like anything in the commercial world, marketing policies change. As they change so do the price and discount structure. For example, a new type of discount may be necessary in order to secure a big new contract.

For a computer bureau, or the computer centre of a group of companies, the problem is even greater, for each user will probably require something different.

This results in a great expenditure of time and effort in modifying programs for each user, and then maintaining the many different versions of the programs that result.

The only real solution is to have a system that allows each user to specify the layout, con-

Turn to page 13

### SALES INVOICE

From NOR BUSINESS LTD ACCOUNTS DEPARTMENT 15 CROSS STREET MANCHESTER M2 3UP		Invoice No. 00000007 Invoice Date 20/07/78							
Customer No. 000001234 Despatch No. 000001234		Despatch Address NORTH SEA SUPPLIES LTD RIVER DEL VARD 156 SPANISH ROAD ABERDEEN							
Special Instructions REMAINING 70 NTS OF CUPIDO TO BE SENT NEXT WEEK									
Product Code	Product Description	Unit of Issue	Qty	Price	Discount	Goods Amount	VAT	Total	
010001	DISCOUNT - 75%	REEL	1	10.55		10.55	0.00	10.55	
010002	DISCOUNTED MAP, TAPE	REEL	15	3.50	10.50	49.50	3.50	53.00	
010003	CUPIDO 100 KVA. 0.8A	ALTA	100	0.80		80.00	0.00	80.00	
010004	CUPIDO 100 KVA. 0.8A	ALTA	1	1.00		1.00	0.00	1.00	
Handling Charge							1.00	0.00	1.00
Totals							140.55	11.16	151.71
Amount to pay							151.71		151.71
2% Discount allowed if payment in full received within							Amount	3.03	
NEW PRICE LIST & CATALOGUE NOW AVAILABLE. PLEASE ASK.									

Figure 2. A typical invoice produced by the NOR-INV system.

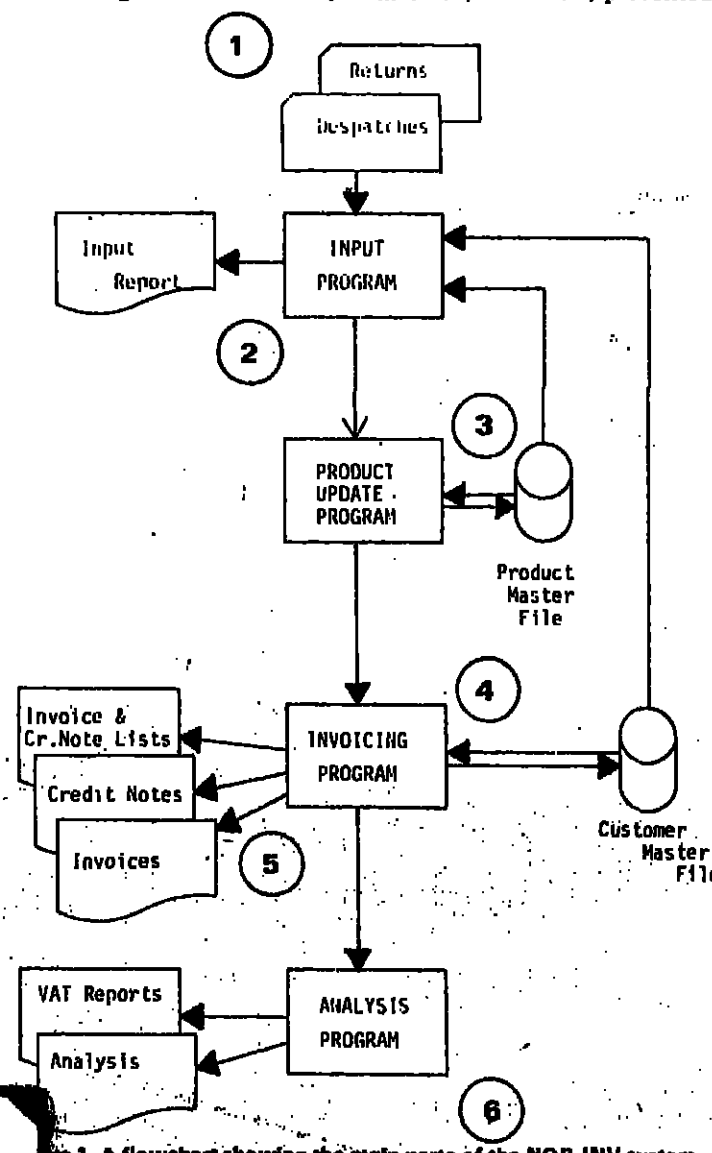
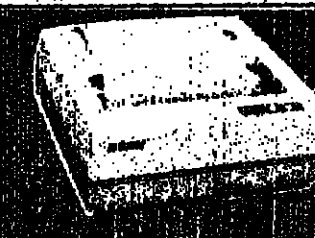


Figure 1. A flowchart showing the main parts of the NOR-INV system



The winning men's team from the Midland Bank. (Left to right, back row) Rob Adams, Dave Wareham, Graham O'Neill. (Front row) Ian Balahaw, Gary Milligan, Paul Ashworth.



Manweb, the top ladies' team: (left to right) Vivien Ellins, Cheryl Hunt, Jane Perry, Liz Jones.

## Rain didn't stop play

DESPITE a cold and rainy day there was plenty of enthusiasm at the North West Heat of the Computastars competition, held at the Kirkby Sports Centre, Liverpool. The unseasonable weather cut the entry so that it was the smallest so far in the series with 11 men's teams and four women's teams taking part. Winner of the men's individual title was Paul Bickerton of the Inland Revenue, while the women's title was shared by Jane Perry of Manchester and North Western Electricity Board, Manweb, and Jenny Baines of Littlewoods.



Peter Smith, of Quadrant Software (left), prepares to put the shot which won him second place in the men's event, and (below) Cheryl Garner of Littlewoods winning the ladies' shot put.

Competition for the men's team title was close with Midland Bank scoring 1154 points to win from Manweb with 1004. Third was Inland Revenue with 106. Top women's team was Manweb, with Littlewoods second and Inland Revenue third.

The final heat in the competition, that for the Midlands, takes place next Sunday, July 8, in Birmingham at the Alexander Stadium, Perry Bar. The events are due to start at noon.

The grand Computastars finals will be at the Crystal Palace sports complex, south London, on Saturday, September 30. This will be the biggest sports event ever organised for computer people and preparations are in hand to make it a great day out. Watch Computer Weekly for details.

The Computastars competition has been organised by John Goldsmith Computer Services with the support of Computer Weekly. Anyone who would like to assist at the Birmingham heat or at the finals should contact Gordon Cairns on 01-828 5356.



Jenny Baines



Jane Perry



Paul Bickerton





# Extra pressure on the disabled

IN THE BCS Specialist Group for the Disabled, of which I am the new secretary, there has been a lot of talk of training the disabled for work as programmers and of producing electronic aids to help the disabled find work in the computer industry.

While this is laudable for those who are actively seeking work, I feel that it puts extra pressure on the disabled.

Much has been made of the effects of microprocessors in taking over a great deal of the workload leaving more time for leisure activities. This calls for a different attitude to work. At present society judges a man by his work and people vie with each other to explain how long and hard they work.

With modern aids in communication, word processing, computing, etc, a whole new world is opening up to even the most severely disabled. With these aids they will be able to become writers, artists, researchers, etc. How much better, when asked the question "What do you do?", instead of saying "I am disabled," I could answer "I am writing a novel, or am studying the flora of the Seychelles."

If the disabled, an "enforced leisure class," can make use of new technology to become useful citizens they may be able to point to the way the rest of society will have to learn to live — and enjoy its leisure — when all the jobs we now consider most important have been taken over by computer-board systems.

R. A. POTTER  
Secretary  
BCS Specialist Group for the Disabled.

# Too late for Britannia

NOTE that you have given a report on the introduction of the Britannia Building Society's terminal system, Midas (CW, June 22). The information that the story was issued by us in a press release towards the end of last year and is some six months out of date. Perhaps your journalists would better be employed writing history books.

The story mentions that completion of the first phase of the system was expected in June this year and, in fact, the terminals have been installed in 40 branches on schedule.

D. MAWDSLEY  
Data Processing Manager  
Britannia Building Society  
Leek, Staffs.

congratulations to the Britannia for getting its system up and running on time. We dealt with the story when the information first issued but it missed the point that time round and, was out of date. The report on slipped past our sharp editorial eye on this occasion. We have our heads in shame. Nevertheless we are sure that our readers would want to know of the progress that has been made by building societies in this area. It is a pioneering venture by the Britannia Building Society, which has, through various banking institutions have, of course, had similar terminal systems running for some time. EDITOR.

The Editor welcomes letters on subjects published in Computer Weekly, on an original basis. All letters must be accompanied by the writer's name and address, not necessarily for publication. All letters are liable to be cut at the discretion of the Editor. Unless otherwise stated, the views expressed are those of the writer and not necessarily those of the Editor.

# LETTERS

To: The Editor, Computer Weekly,  
Dorset House, Stamford Street, London SE1 9LU

# More questions for the Tories

**FOLLOWING the Computer Weekly Interview with Sir Keith Joseph, who co-ordinates the Tory Party think tank, the Centre for Policy Studies (CW, April 27), a reader, J. Blair, wrote to the Editor suggesting further questions that could be posed. The questions were forwarded to Sir Keith and he has now replied. Here we publish Mr Blair's questions and Sir Keith's answers.**

**Question 1:** If State intervention is always so disastrous, would Sir Keith still oppose the Ferranti rescue? This firm has been transformed from a "lame duck" into a record profit maker. Had Industry Secretary Tony Benn not injected £15 million into Ferranti, after NatWest's refusal to extend the overdraft, would we have seen more competition or more monopoly? We all know that the

# Sir Keith replies

SIR Keith replied as follows:

Your Questions 1 and 2 suggest that if Ferranti or the leading UK software houses had not been taken on board by the NEB, they would have been "paralysed up" by a handful of big companies. There are several points to make in reply.

First, because companies are big it does not follow that they do not compete. If they act in collusion, then there are powers for governments to investigate and to stop.

Secondly, the shortage of vigorous and expanding companies in many fields flows from the incomprehension and the hostility in relation to enterprise manifested to some extent by several post-war governments, and, in particular, by the present government. If income and capital taxation were less heavy and if government spending and regulations, coupled with controls on pay, prices and dividends, did not so stifle the private sector, we would have a far more numerous and active crop of companies.

As you probably know, the death-rate of small businesses has rocketed and the birth-rate of small businesses has plummeted these last years.

Your third and fourth questions imply a seller's market in connection with both IBM and ICL. I recognise the dominating position built up by IBM. But I do not fancy that this would be shattered by anything likely to be achieved by the NEB. Moreover, it is not valid to imply that customers have nowhere to go but IBM or ICL.

# Solution is not unique

I FELT it incumbent upon myself to inform you that your solution for the cryptogram:

BOY  
GIRL  
LOVE  
ELOPE  
883  
8427  
7801

is not unique. Another possible solution is:

17881  
8427  
7801

As you will see, both 883 and 8427 are prime numbers. A. G. HILLARY

ONE of the few certainties in the computer industry, over the next decade, is that preservation of users' investment in software will assume a steadily growing importance. So it is safe to assume that one of IBM's lesser known operating

# Taking a second look at the Virtual Machine

THE Virtual Machine, VM/370, operating system, from IBM, has come in for an unaccustomed glare of publicity over the past few months as a result of widespread suggestions that it is likely to be featured strongly in the announcement of the forthcoming E-series which is to replace the low end of System 370. Whether or not the forecasters have got it right, VM offers a unique range of capabilities to IBM 370 and 3030 series users and is well worth a second look.

VM/370 was born out of a project at IBM's Scientific Centre at Cambridge, Massachusetts. In 1984, the centre began working on a project which was intended to make computers more accessible to the user. The first step was to develop hardware and control software, producing an experimental machine which added virtual addressing to the then new 360/40.

In 1987, the only IBM 380 machine with virtual storage, the 360/87, was announced, together with the Control Program 67 operating system and CMS time sharing software.

CP-67 was the direct forerunner to VM/370, and CMS at that time stood for Cambridge Monitor System. The name, though not the abbreviation, was later changed, and CMS now signifies Conversational Monitor System.

The development work continued within IBM and CP-67 evolved into CP-370; this ran on a 380/87, and made it possible to emulate the virtual storage 370 environment before the hardware was available.

In 1972, the first virtual storage 370s were announced, together with four new operating systems. DOS/VS replaced DOS; OS/VS1 replaced MFT; and OS/VS2 replaced MVT. The fourth operating system was VM/CMS, which initially simply enabled several users of a 370 running under VM to set up their own CMS "virtual machines."

The key feature of VM/CMS was this facility which allowed virtual machines to be set up within the system. Although CMS provided something new, and was therefore initially stressed, it was equally possible to set up virtual machines for most other IBM operating systems to run under VM.

It offered a time sharing facility for medium scale users, enabling them to do program development on a time machine using CMS while simultaneously running at least a part of their standard workload under their mainstream operating system. However, market response was uneven, and reports soon filtered back that while MFT ran quite efficiently under VM, OS/VS1 and DOS/VS imposed overheads which for many users were unacceptable.

This was hardly surprising, since even without CMS, VM duplicates many of the features of any mainframe operating system, but it limited usage of VM.

In 1974, IBM offered a VM assist feature for the 370/135, 146 and 148, which went some way to improving VM performance by putting parts of it into

systems, and one which offers a solution to the problem of operating software compatibility, will emerge from the shadows and gain an increasing number of devotees in the months and years to come.

priority, while the computer-bound jobs get longer time segments at lower priority. The operator can anyway control the priority given to different parts of the system.

Since VM/CMS is an operating system in its own right, it comes with a number of language compilers. The PL/I optimising and checkout compilers are the same as those under OS; the same three Fortran compilers as are available with OS are supported by CMS, but have additional interactive debug facilities. The Cobol compiler with interactive debug is the same as that under OS.

There is also an assembler, a VS Basic with interactive debug, and a VS APL, and other 360 compilers and packages have been adapted by users to run under VM/CMS.

Access methods supported by VM/CMS are Virtual Storage, VSAM; Sequential, SAM; Basic Direct, BDAM; and Basic Partitioned, BPAM.

As CMS was designed to be easy to use, there are a number of attractive features, notably a synonym facility which allows standard functions in the command language to be renamed, an aid much appreciated by people who do not understand much English.

Apart from online program development in general, the area where VM offers significant benefits is where a user has moved from, say a 138 (to a 303), and intends to switch to a new operating system. He can set up one or more virtual machines to run his full existing workload, while doing program translation and developing completely new applications under CMS, later running adapted programs under the new operating system, a reduced workload under the old one, while program development continues, all on the one machine and simultaneously.

Now that 148s have been delivered in larger numbers, the acceptance of VM has risen sharply, although perhaps not to the extent that IBM might have wished; the company has been promoting the concept that a VSI user with a 145 should run VM alongside CMS. It is anyway difficult to gauge how widely VM is actually used, because although a growing number of installations have the tapes, many use it rather infrequently.

The minimum configuration required to run VM has grown to a 384-Kbyte 370/135, but memory limitations will be a serious of the past once the E-series appears, because the new IBM line is expected to offer memories in the 1 to 2 Megabyte range of the 148.

It is significant that the new National Semiconductor System 400 32-bit microcomputer, which has the full 370 instruction set, is offered with only two operating systems: DOS/VS and VM/370.

The National Semiconductor machine reflects the declining cost of hardware in that it offers up to 16 Megabytes of main memory, and this trend, allied to the accelerating cost of software development is minimising the disadvantages and enhancing the attractions of VM, indicating a bright future for this unusual operating system.

# By JOHN FINNIE



IT ought to have been obvious if we had listened to the lesson of the past, to that one lesson which says that technological prediction is generally right, but social prediction is generally wrong. The gazers into the crystal ball in the late 1970s should have listened to that lesson. Their technical predictions came awesomely right. Micros, fibre optics, telecommunications all threw up marvels beyond the most ambitious dreams and at prices which stood the inflation curve on its head. The predictions of the social effects were hopelessly wrong.

For example, the technical developments to what was known in the mid-1970s as the TV set have been remarkable. As predicted, it did become the key to an incredible store room of knowledge though it took 10 years from the introduction of videodata, before the entire contents of the British Library shelves supplemented the airline timetables and mail order catalogues that had previously dominated the databanks; and a further five years before the

joggers and squash players, and the golfer's micro which displays the recommended club choice and length of backswing, taking into account metres remaining and the exponentially smoothed career average, distance with that club after adjusting for wind, humidity and the state of the fairways.

The effect on the spectator sports was equally dramatic. In America, it had been the tradition that all sports performance that could be measured — batting averages, number of assists, average number of fumbles per game. Up until the early 1980s, the analysis during the game was provided by professional sporting statisticians, but with the advent of the battery powered portable micro the spectator could work out for himself the statistical significance of what was happening down there on the Astroturf. This posed a threat to soccer, since soccer in the 1980s was a fluid game with brief, irregular stoppages in the action.

In 1984, the US soccer authorities changed the rules to allow both time out and quarter time intervals which gave the spectators the chance to carry out his file housekeeping and run a selection of displays. And in 1985, they introduced a gridiron pattern of pitch markings to allow distance to be measured more accurately. The UK Football Association resisted these changes until 1987, and adopted them only in the face of competition from Rugby League information technology. The use of the portable micro by football supporters caused initial difficulties, not least in the notorious Millwall riot of 1988 when a police horse was seriously wounded by a micro thrown from the crowd.

However, no account of the impact of computer technology on the public would be complete without mentioning the great point-of-sale debacle. By the 1950s, the clearing banks had become increasingly irritated by cash, a commodity which made the fingers dirty and which excited the criminal classes. They mounted a major drive to convert cash users to cheque users. By the 1970s, the banks had become increasingly irritated by cheques, since people wrote them out in a script not compatible with OCR equipment — those people, that is, who did not choose to exercise their legal rights to use mill-stones or dead albatrosses as cheques. The banks put a massive investment into getting up real-time instant debit systems.

The new facility was uniquely successful with the elderly and the eccentric who had resisted the move to cheque books. It was boycotted totally by the cheque book-bearing classes, which quickly recognised that the payment for the Friday night

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Yet videotape never became the overwhelming success that was predicted for it. The basic reason for its decline was that few husbands and wives could bear to read the same text simultaneously.

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This essay, which won a special award for John Finnie of Solihull, in the Computer Weekly/Dataskil essay competition, Computerstyle 2000, is more pronounced for the negative aspects the human race is likely to face in the years to come rather than the positive benefits which most of the other entrants foresee. The author works for GKN Group Management Services (Smethwick). The essays of the two other special award winners, Paul Holden of Dublin, and A. Thornton of Derby, will be published soon.

# Doomsday School were broadly right in predicting the worst



The impact on working life has been dramatic, primarily on employment opportunities, but not least on — as the industrial sociologists would say — the man/job interface. Back in the 1970s, when so-called minis — massive machines, some larger than a wardrobe — were introduced, the mini enthusiasts argued strongly that the large central machine must go the way of the dinosaurs, since user identity was paramount. Within minutes of the machine's introduction, the mini machine was rejected by the man who wanted to keep his big machine and the Father figure of the Production Planning Section who wanted to keep its big machine and the Father figure of the Tools Requisitioner who, in the interests of user identity etc, wanted his freedom.

Senior management were half-hearted in tackling this conflict, since they themselves were facing up to the word processing dilemma. By 1983, it was possible for the manager's written text to be captured by OCR — without benefit of secretary — provided the manager had gone through a two-week course flatteringly entitled "character formation". By 1987, it was possible for the spoken word to be captured and converted into printed text, provided the manager had gone through a three-week course in

The use of the portable micro by football supporters caused initial difficulties, not least in the notorious Millwall riot of 1988 when a police horse was seriously wounded by a micro thrown from the crowd.

which makes idleness more tolerable, the Department of Employment Preservation, which sets the financial levy to be paid by companies, manufacturing or installing labour saving equipment; and the Department of Employment Creation, which compensates companies for every labour saving machine taken out of use.

The most authoritative predictions suggest that society should have successfully adapted to the technical revolution within the next 10 years. Perhaps 20 years, but definitely not more than 50.







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BSEE or BS in Computer Science with 2-3 years experience in software development of real time mini-micro computer systems. Experience with I/O drivers for devices such as cassettes, magnetic tapes, floppy disks or disks is preferable.

### FIRMWARE ENGINEER - DIAGNOSTICS

Minimum two years experience in hardware design, programming in assembly language of micro computers. Diagnostics programming a definite plus. BSEE or equivalent desired.

### SENIOR MECHANISMS ENGINEER

BSME (MSME desirable) with a minimum of eight years experience in the development of printers or magnetic tape or disk recording mechanisms. Knowledge of materials, manufacturing methods, and dynamics analysis desirable.

### SENIOR ANALOG ELECTRONICS ENGINEER

BSEE (MSEE desirable) with a minimum of eight years experience in the development of analog electronics for data terminals or computer electromechanical peripherals. Servomechanism and/or read-write background desirable.

### SYSTEMS LANGUAGE DEVELOPMENT

Your responsibilities will include proprietary systems language development, compiler development, code generation for new micro processors and application of source optimization techniques. BS or MS in Computer Science or related field with relevant course work and/or experience. Knowledge of block structured language and machine level programming, preferable for 8080 or other micro processor is a plus.

### I/O HANDLER PROGRAMMER

BS or MS in Computer Science with four years of experience (two years in real-time programming). Will design, implement and maintain device drivers and handlers on an advanced multi-processing system.

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You will be responsible for designing, implementing and maintaining access methods on one of our advanced multi-processing systems. A Computer Science education would be a plus.

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### Senior Manufacturing Analyst

Middlesex

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For further details please contact our CROYDON office and quote reference CW/22 BJ.

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... is a large distribution organisation based in BIRMINGHAM and currently enjoying an excellent reputation as a market leader in its field.

### THE REQUIREMENT

... is for a Programmer with COBOL experience to work within a friendly environment.

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Our Client provides computer services to a number of industrial companies and is part of a large multi-national group. Its base is at Guisborough close to the Yorkshire Moors and Dales. Most vacancies are at this location although further opportunities exist at the group's headquarters in Middlesex.

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Applicants should have a minimum of three years' Analysis experience and should be keen to control and manage a small team of professional computer staff. The Company, situated 25 miles from London, offers a starting salary to £7000. Relocation Assistance, Five weeks' holiday and excellent career prospects.

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Salaries c£5000 p.a.

Our client is a highly successful INTERNATIONAL manufacturing concern, with extensive commitment to data processing. The current mainframe is an IBM 370/145 under OS/VS1/MVS, with a comprehensive tele-processing network utilising CICS. Their future plans include a twin CPU site with the addition of an IBM 370/158, further SYSTEMS DEVELOPMENT and MINI-COMPUTER APPLICATIONS.

They now wish to appoint two COMPUTER PROFESSIONALS, who will play an active role within the data function:

### PROGRAMMING TEAM LEADER

- You should have:
- \* a minimum of 3-4 years' programming experience, preferably with PL1 and some ASSEMBLER knowledge.
  - \* experience of MODULAR programming techniques and have an understanding of STRUCTURED programming methods.
  - \* IBM background and SUPERVISORY experience would be a distinct advantage.

### SENIOR SYSTEMS PROGRAMMER

- Applicants should either:
- \* be currently working in a DOS/VS environment and have the desire to be involved with the OS/MVS system; OR
  - \* be currently employed in a systems programming role with 12 months experience of operating systems and system generations/releases.

The successful candidate will become a member of the technical software team and have specific responsibility for investigations, problem solving, generation of CICS and the tuning and enhancements of software packages.

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**SCOR**

Computing Services Association

# Senior JCL Clerk

A Senior JCL Clerk is required in the IBM 370/158 installation at the American Express Card Division Operating Centre in Brighton.

Suitable applicants must have a detailed understanding of JCL as applied to the IBM OS/VS1 System together with a good understanding of IBM utilities and be able to set-up and check JCL. The person appointed must have the ability to resolve problem situations quickly and accurately. All applicants will have at least three years D.P. experience and must be prepared to work a rotating three shift system.

The Company offers first class working conditions and fringe benefits including four weeks annual holiday and a subsidised staff restaurant.

Write giving brief details of relevant experience on telephone for an application form to: Dennis Perren, Central Personnel Department, American Express, Annex House, Edward Street, Brighton BN2 21P. Telephone Brighton 693555 Ext. 6512.



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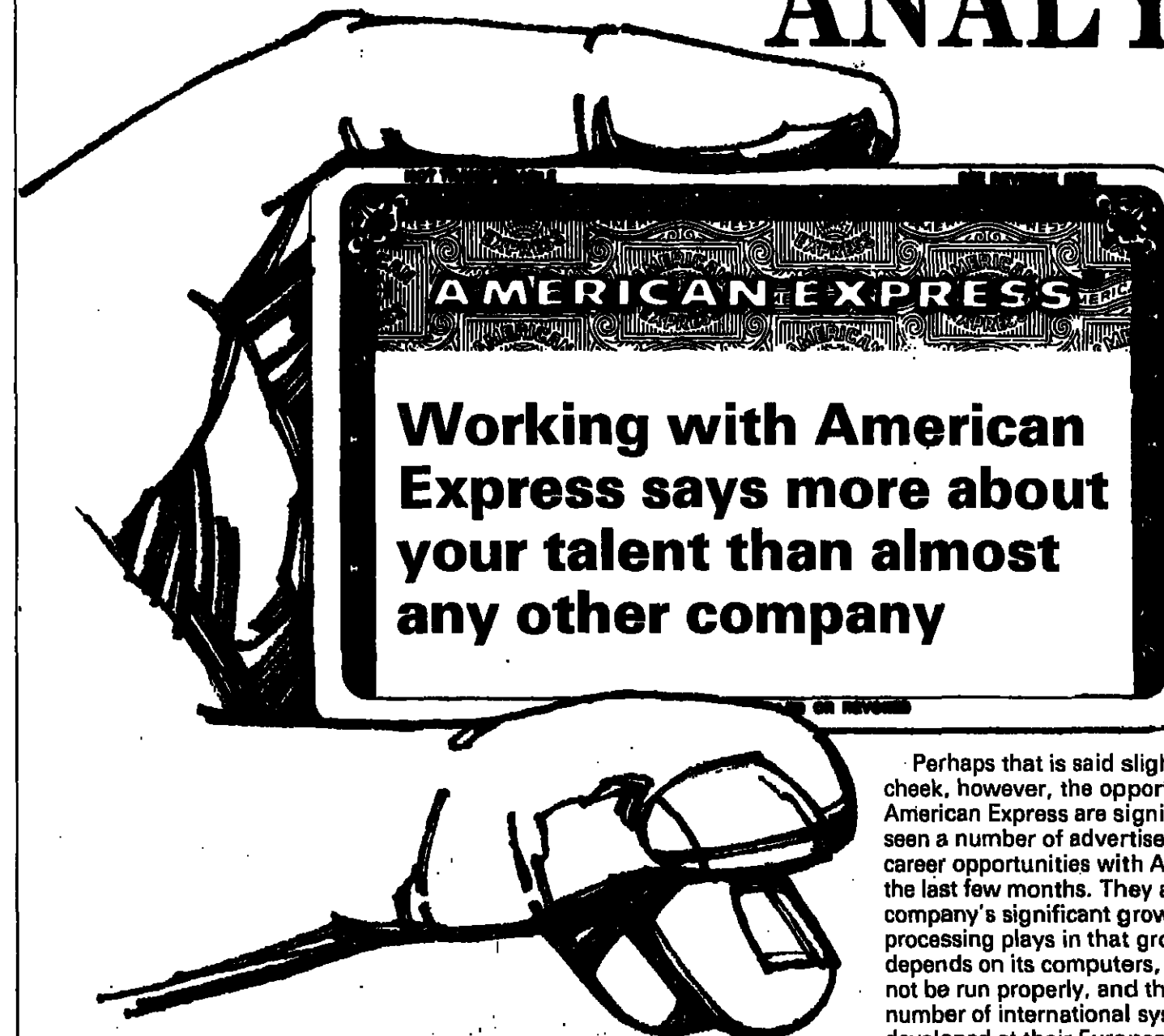
Taunton Cider Company is a rapidly expanding major British cider maker based in the outskirts of the pleasant county town of Taunton in West Somerset.

We are looking for a mature professional to manage a small computer section and to develop our present ICL 2903 installation.

This position will be of interest to an existing systems analyst who is now ready for wider and more challenging responsibilities, or someone presently managing a small installation. He or she will almost certainly have 2503 experience and will be familiar with REXX II. Experience in a fast moving consumer goods industry would be an advantage.

Starting salary is negotiable depending upon experience. Attractive fringe benefits include profit sharing, generous pension and life assurance schemes, free BUPA and relocation assistance where appropriate.

# PROGRAMMERS AND ANALYSTS



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They would now like to meet.

## Systems Analysts

Systems Analysts who have done things, not in any specific applications environment, more important is enthusiasm, accuracy and total commitment to producing results. From your past experience you will be able to prove that you have been successful and feel that you could make a significant contribution to a new employer. Obviously one can use many 'buzz' words in writing advertisements of this kind. However, perhaps all that is necessary is to say that without keeping up to date with computer technology, American Express' business could not be as successful. Therefore, the opportunities both in terms of interesting applications and interesting technical developments are there. Ref. 1767/CW.

## Programmers

Programmers who have done things. The opportunity offered is again significant. The company realises the importance of programming within its career structure. The opportunities being created in the programming area in the immediate future are totally sensible and realistic. If you have an Assembler background or a COBOL background, then we would like to meet you. The positions available are at several different levels and we would particularly like to meet you if you have between 18 months and 2½ years experience. All too often companies give little or no thought to development opportunities for programmers. Here you will certainly find things are different. Ref. 1768/CW.

We hope we have said enough about American Express and the opportunities to interest you. We would like to meet you quickly. Therefore, interviews will be arranged either in Brighton, in London or the provinces, whichever is most convenient. Please contact John Goldsmith either by telephone or by sending a brief history. You will not be asked to fill in a form until we have met you.

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To sell TPS - the leading software product for ICL communications systems. We are currently taking one order every three working days and need additional Sales Staff to respond to the tremendous demand for TPS and other Telecomputing quality software products. Computer experience and sales motivation are essential; marketing are useful but not mandatory. Ideally we would like to meet system designers and programmers who have either moved or wish to move into sales.

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Ref. S1 0607

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Applicants possessing the described qualifications may write, giving brief personal career details to:

Selection Division  
Civil Service Commission  
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An opportunity exists for a commercial systems analyst to support the establishment and enhancement of these "in house" systems. The Company is also embarked upon the development of an ambitious integrated insurance system with real time characteristics and the successful candidate will have the opportunity to become involved in the activity in the future.

The Company offers a competitive salary, plus mortgage subsidy facilities, and contributory pension, life insurance and permanent health schemes. Generous relocation expenses will be available if necessary.

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Diane Smith, Personnel Department,  
TSB Trust Company Limited,  
P.O. Box 3, White Bear House,  
21 Chantry Way, Andover, Hants. SP10 1PQ.

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Please telephone or write to: Peter de la Haza, Technical Manager, Computer Instrumentation Limited, School Lane, Chichester, West Hampshire. Telephone Chichester 66321.

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for

## SYSTEMS INTERNATIONAL

Europe's leading computer and digital systems monthly magazine needs a Deputy Editor to join its lively team based in Central London. The successful applicant must be technically competent in one or more of the following areas: systems design, electronics, design engineering, computer science. He/she will preferably have some writing experience and will be required to deputise for the Editor in his absence. Some travel is involved. Excellent pension scheme, subsidised staff restaurant, etc. Salary negotiable, but not less than £5,100 p.a.

Apply in the first instance to Frank Booty, the Editor, on 01-281 8000 or write to him at Systems International, IPC Business Press Ltd., Dorset House, Stamford Street, London SE1 9LJ.

**CIL**



## THE STOCK EXCHANGE

The Stock Exchange is currently running two machines — a 2 megabyte 370/158 under OS/VS1 (RTAM) and a 2 megabyte 370/148 under VM/CMS also with OS/VS1.

With a large increase in the overall workload forecast for the near future the 370/148 is due to be replaced by a new and more powerful machine.

Because of these developments they are seeking to fill the following positions.

### COMPUTER OPERATOR circa £4300

The requirement here is for a good all round operator who has the flair and potential to progress into a more senior position in due course.

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Obvious benefits inherent to this position include immediate supervisory responsibilities, plus the longer term advantage of seeing new Hardware and Software implemented and developed.

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Covering a wide area of responsibility this position would suit people with quite diverse backgrounds in Systems work.

Essential requirements are a good knowledge of either OS or OS/VS1 Operating Systems and of OS/JCL and Utilities, together with current VM/370 experience. Also a minimum of 1 years programming in ASSEMBLER language plus experience writing in PL1 will be expected. Part of the work will involve analysing and improving overall system performance, so any knowledge of IBM/370 Hardware and Software fundamentals is desirable, as is any experience of performance measurement and estimation techniques.

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To lead a section responsible for producing the software to run in the central computer of the AEW Nimrod. This task will involve interpreting

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## RESEARCH ASSISTANT

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The post will be based in Milton Keynes.

Candidates should have a first degree in a relevant field and a good working knowledge of at least one high-level computer programming language. The successful applicant will be encouraged to register for a higher degree.

The post is tenable for two years with an initial salary in the range £3,189-£4,601 per annum.

Application forms and further particulars are available from The Recruitment Office (MB3679/2), The Open University, P.O. Box 75, Walton Hall, Milton Keynes MK7 6AL, or by telephone from Milton Keynes 83406, or there is a 24-hour answering service on M.K. 83868. Closing date for applications 25th July, 1978.

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Computer Systems

A vacancy exists for an energetic Sales Executive to join a team which has been set up to develop our business with commercial computer users in the U.K. and abroad. The nature of our business involves considerable systems analysis and design on the part of our sales staff, in close collaboration with users and our own specialists, in addition to the primary role of selling and negotiating contracts. The position will therefore appeal to a person who enjoys variety and deep involvement in system aspects.

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Physical environment alone makes this job unusually attractive. Our Client's small, elegant offices are located in the heart of the Thames Valley countryside, among some of the most beautiful scenery in England.

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And here, the attractions are just as great.

Our Client has just ordered a System 3, Model 15 and a remote System 34 to handle an ultra-sophisticated inventory control and order processing system. One of the most urgent tasks facing the new Analyst/Programmer will be to implement this system — a task which will involve detailed systems and programming design. Future work within our Client's DP department will involve design, development and support for extensions to this system, and for

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The starting salary will be up to £6,500, and the benefits package will appeal to someone starting to take a long-term view of his or her career.

If you're interested please phone James Plummer on 01-491 4706, or write to him at:



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Staff Services Division of BOC Datasolve Group and a member of the Computing Services Association

## ANALYST/ PROGRAMMERS

to work on a variety of real time applications in Germany. Successful applicants will have 3-4 years' experience in assembly programming on minicomputers, with good knowledge of system software on any of the following PDP11, Honeywell 216, Pdp11, IBM System/360, and should have worked on Real Time Process and Production Control or other Communications systems. Fluency in German is desirable but not essential. Above average salaries and relocation expenses will be paid.

Contact: P. S. Pruegel, Managing Director, SGS Data systems GmbH, Friedrich Str. 10, 6000 Frankfurt/Main, W. Germany. Tel. (0811) 725244.

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Zeus-Hermes is a leading Software House and Consultancy which has specialised in Real-Time Software and Mini-Computer Systems since 1969. Now in 1978 one-third of our staff are engaged on MICROPROCESSOR projects. We are still continuing our planned expansion and require people who are keen to succeed in the areas in which we specialise.

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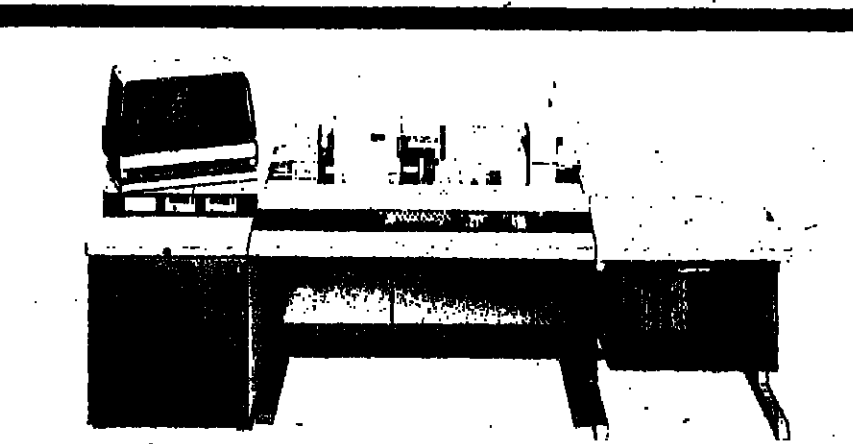
Candidates should have substantial experience in Assembly code or Machine code and preferably also in the development of Software. Specific experience in Minicomputers such as PDP 11, NOVA or Interdata, or micro-processors such as Intel 8080 or Motorola would be of great interest as would knowledge and experience of: COMMUNICATIONS SOFTWARE, TERMINAL EMULATORS, COMPUTERISED TELEPHONY, MESSAGE SWITCHING, HARDWARE DIAGNOSTICS, WORD PROCESSING and TYPESETTING.

We would be particularly interested to talk to any people with PDP 11 experience under a real-time operating system.

These positions offer the opportunity to work on original systems from the design phase on, with a dynamic organisation whose professional and responsible attitudes, together with imaginative forward planning, have created a highly successful company. Work is in Greater London and the Home Counties, and opportunities frequently occur in Holland and Belgium which additionally offer generous overseas allowances.

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Capper Street runs eastwards off Tottenham Court Road between Goode Street and Warren Street stations.



## Senior Analyst Programmers

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Analysts to travel to European centres for the purpose of systems development within the Data 100 European network.

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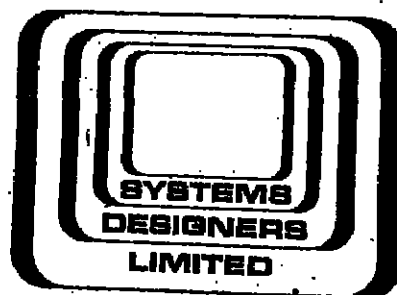
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Please write to, or telephone, Mike Bray at our Head Office: Systems House, 87-81 High Street, Finsbury, Surrey GU1 5HH. Telephone: Camberley (0276) 62471.

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Salary — around £6,000 p.a.

### Location—Croydon

We have ambitious plans to extend the use of computer techniques at MJN. We are upgrading our

### IBM SYSTEM/3 MODEL 12 TO 96K

and, using CCP, we are developing on-line systems to link our office throughout the UK. We want a further

### RPG II ANALYST/PROGRAMMER

to join our team and help us to push through our development plans. You will have the challenge of controlling projects from design to implementation.

As major mechanical engineering contractors we recognise the important part which the success of our computing developments has to play as we expand our activities not only at home but especially overseas in the Middle East and Africa.

If you would like to join our team, and have 2-3 years' sound RPG II programming experience — some knowledge of CCP would also be helpful then ring Mr. R. F. Chambers, D.P. Manager on 01-886 5577 for an initial discussion or write to him at MJN House, 11 Dingwall Road, Croydon, Surrey.

**MJN**

## ANALYST/PROGRAMMER CIRCA £5,000

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### The Person:

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For further information  
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This presents a real opportunity both for established and 'up and coming' persons to have an opportunity to be involved from the outset but still retaining a large measure of job satisfaction, career advancement and security which is not offered by contract operations for instance.

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Programmers c. £5,000 p.a. Systems Analysts To £7,000 p.a. O & M Analysts To £5,000 p.a.

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Applications may be made by telephone to Mr. A. THORP, 01-202 4947, or in writing to F.C.S., Computer Staff Personnel Office 418 Hendon Way, London, NW4 3LH.

**FCS**

FREIGHT COMPUTER SERVICES LIMITED  
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## SYSTEMS PROGRAMMERS (Sales Support)

Salary £6-£7,000 + 2 litre car  
+ other major benefits

Locations Manchester and Kent

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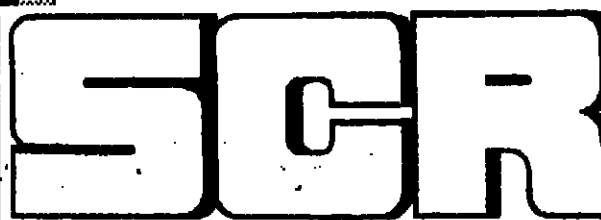
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CONTACT: Sheila Bradbury for the Manchester position on 081-833 0676.

CONTACT: Valerie Hall for the Kent position on 01-935 0671.

Ref. No. CW/7/2

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In addition the engineer will be required to develop hardware and software for a variety of minicomputer and microprocessor systems.

A degree in Electronic or Electrical Engineering or Computer Science is normally required for this post. Experience of computer hardware and software would be an advantage.

Salary £3,825 - £4,086 plus pay supplements of £518 or £520 p.a. Phase 3 review expected 1st July, 1979.

Application form and further details available from Staffing Officer, Leicester Polytechnic, P.O. Box 142, Leicester LE1 9BH. Tel: (0533) 60181. Ext. 2301.

### CDC SCOPE 3.4/NOS-BE SYSTEMS ANALYST

\* We are looking for a suitable applicant with at least two years relevant experience with CDC software to fill the post of Systems Analyst at our London Processing Centre using a CDC CYBER 175 and associated peripherals.

\* The job involves being responsible for Software Maintenance and associated system installation projects.

\* A very attractive salary, plus benefits associated with a large International Company will be offered to the successful applicant.

\* If you consider yourself suitable, and wish to know more, write in confidence to

G. Baum — Operations Manager  
Compagnie Generale de Geophysique  
47/65 The Vale, ACTON, London W3 7RR  
or Telephone: 01-749 2565

### LEICESTER POLYTECHNIC Faculty of Business, Computing and Statistics Applications are invited for the following

**SENIOR LECTURER /  
LECTURER  
GRADE II**

post Candidates should be academically and/or professionally qualified with appropriate experience for Degree and professional courses.

Salary In accordance with the Birmingham FE Report £4101-£7065 per annum.

APPLICATION form and further particulars available from: Staffing Officer, Leicester Polytechnic, P.O. Box 142, Leicester LE1 9BH. Tel: (0533) 60181. Ext. 2301 to be returned as soon as possible.

## MYRIAD APPOINTMENTS LIMITED

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### 18 MONTHS' COBOL PROGRAMMER/ANALYSTS

SOUTH LONDON

c. £4800 + Bonus

Our client operates an IBM 370/168 under O.S. in America, with a network of links to the U.K. and Europe. On-line processing and systems development are used extensively, offering successful candidates the opportunity to enhance their careers in this area.

Programmers, with a minimum of 18 months' COBOL, will gain analysis experience and close user contact, particularly at system implementation time. Career prospects are excellent as full training will be given where appropriate.

The company is a major international organisation, whose growth rate has exceeded expectations due to the rapid advancement of specialist technology of which they are the leader in their field.

Located in modern, air-conditioned offices, the company's terms of employment include an annual bonus, a non-contributory pension scheme and paid overtime.

Ref: S3 0807

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# IBM Programmers

## Can you make CICS really work?

Any job which is confined to systems programming alone could lead into a cul-de-sac.

### The Opportunity

Our client has thought carefully about this. They realise that it is difficult to offer career development in the technical support area in a user environment. However, as a large international financial organisation, they now feel that they are able to offer a genuine and interesting career opportunity for someone who has worked in a technical support role, either as a Systems Programmer or as a Senior Programmer.

### The Job

Middleware is being developed to interface CICS with on-line applications. Our client wishes to continue the development of this middleware to cover real time options.

### About You

They want to meet someone who really understands CICS and can integrate applications development with CICS. In this case, for systems such as a real time Foreign Exchange Dealer System. There is no doubt that to enable you to work effectively you would have to learn about applications systems which makes the job that much more demanding. A knowledge of VSAM and DOS/VS would certainly be an advantage and someone who is working in a teleprocessing environment will find the challenge offered very substantial.

### The Reward

Our client is looking for someone who feels that their technical background is being frustrated by the lack of career planning with their current employer. They realise that the development of technical skills is just as important as moving into line management. The salary offered is circa £8,000. In addition to that there is a bonus of up to 6% of basic salary during the first two years. After that time it can be as high as 15%. There is also a low interest mortgage scheme, currently 8%, plus other significant benefits which include subsidised lunch and interest free season ticket loans.

### The Prospects

Benefits alone are not sufficient to attract the right person and our client has given serious thought to career opportunities. These may be running their Technical Support Group, or moving into applications development at a later date. Our client is large enough to enable either of these possibilities to be realised.

If you are interested and would like to know more about the position please contact John Goldsmith at Goldsmith Recruitment International Ltd. Ref. 1769.

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12-22 West Street, Epsom, Surrey, Tel. Epsom 28078.

For Birmingham and West Midlands:  
Gerry Naylor, Area Sales Manager, Atkins-On-Line,  
Regency House, 101 Hagley Road, Edgbaston,  
Birmingham B16 8TA. Tel. 021 454 6011.

For Bristol:  
Brian Brown, Regional Manager, 58 Royal Work Crescent,  
Clifton, Bristol BS8 4JP. Tel. 0272 312241.

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## CONTRACT PROGRAMMERS

Experienced in one or more of the following?  
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## Systems Programmer

Bahrain: c. £12,000 Tax Free

Aluminium Bahrain is one of the leading industrial organisations in Bahrain and the Gulf. In addition to the main production plants, this 120,000 tonne/year producer of primary aluminium has its own infrastructure which includes power generation and distribution, marine facilities, and water distillation. There are more than 2500 employees.

This new appointment is crucial to the development of the company's computer facilities. The computer is an IBM 370/115 using DOS/VS and POWER/VS. A number of functions are already computerised, another eight are under development and it is proposed to progress the installation towards data base and on-line systems. Reporting to the Head of Computer Services, the Systems Programmer will play a key role in this development. He will also be responsible for manufacturing and in-house developed software, and will undertake the design through to implementation of any special programs required.

Applicants must be high-calibre systems professionals with specific experience of IBM software, programming techniques, Assembler language and data base operations. Membership of the BCS, a degree or the equivalent would be preferred.

Salary will be negotiable around the figure given above and will be dependent upon experience and qualification. At the present time there is no income tax in Bahrain and money is freely transferable. Benefits include rent-free air-conditioned housing, 30 days' home leave per year, free schooling or education assistance, free medical care, life insurance and provident fund.

Please write, with full career details, to D. H. Jones, Al-Jal Smelter Services Limited, 22 Grosvenor Street, London W1.

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We invite applications for this new vacancy from candidates who have gained significant experience, either in computer stationary/printing, or with a company marketing ancillary products to the computer industry, which has given them detailed knowledge and understanding of the potential for the computer supplies market. The successful applicant will report directly to the Managing Director and be responsible for optimising the profitable development of the supplies function. This will be achieved by a full assessment of the market, making recommendations for siting up a marketing strategy for the product. Essential qualities are an analytical mind and the high degree of drive and self motivation required to get a new project off the ground. It is unlikely that anyone earning less than £7,000 base salary will have the necessary experience required for this demanding role. Other benefits include contributory pension, 5 weeks' holiday and a company car. Assistance with relocation if necessary. Applications in strict confidence under ref. CSM 10357/CW will be forwarded unopened to our Client, unless you list companies to which they should not be sent in a covering letter marked for the attention of the Security Manager.

CAMPBELL-JOHNSON RECRUITMENT ADVERTISING LIMITED  
35 NEW BROAD STREET, LONDON EC2M 1NH

## University of Bristol

Applications are invited for the post of

### TEACHING ASSISTANT IN COMPUTER SCIENCE

within the Department of Mathematics, available from 1st October, 1978. The successful candidate will provide assistance with the various computing courses provided for undergraduates including some program advisory work and the writing of programs for use in teaching within the Department.

Applicants should have an Honours Degree preferably in Computer Science, and also programming experience in both a high-level language and assembler.

The salary for the appointment will be £3,189-£4,801 p.a. or £3,680-£5,282 p.a., the initial placing depending on age, qualifications and experience. Applicants with a relevant Ph.D. can expect to be appointed on the higher scale.

Further particulars may be obtained from The Secretary, University of Bristol, Senate House, Bristol BS8 1TH, to whom applications should be sent by 28th July, 1978.

## We're going from strength to strength. You could do the same.

We're a world wide manufacturing concern with plants in nine different countries. In England alone we produce a vast range of products including bearings, universal joints, forming and swaging products, as well as many 'specials'. Our computer department is at present involved in floor reporting for the company using COBOL on an IBM system, DOS/VS, and a fully integrated Database Total Management System. And we're about to take on responsibility for other terminals in the UK and Europe. We're growing fast. That's why we need now staff. And we're prepared to pay for the right people. Both positions include excellent salaries, sick pay, contributory pension scheme, four weeks' paid holiday, and real promotion prospects. Plus the possibility of travel to Europe and the USA.

**SENIOR SYSTEMS ANALYST**  
You'll be responsible for defining and ultimately solving data processing problems. This will involve feasibility studies and tests on existing as well as up-and-coming systems. You'll also be in charge of training the appropriate personnel. To be successful, we think you'll need a minimum four years' industrial experience, a keen analytical mind, and the knack for co-operation.

**SENIOR PROGRAMMER**  
Working with the senior systems analyst you'll be writing, and implementing various systems, including software. Because systems are provided for all three UK Torrington plants, this will mean close liaison with users in other locations. You'll also be called upon to do a certain amount of new system analysis, often on outside software packages.

And you'll be training personnel. So you'll need experience in controlling people and other programmers. If you're looking to get on in computers, it will pay you to talk to Torrington Telephone Rollin Goodall, Management Services Manager or Mrs. Jo Wright Personnel Department on Coventry (0203) 74241 now for more details. Applications are welcome from both men and women.

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## PROJECT LEADER — FINANCIAL SYSTEMS SHEFFIELD

SALARY TO £8,500 plus extra 10% after three months' satisfactory employment.

DON COMPUTER SERVICES LTD. provide the Data Processing requirements of the Geo. Bassett Group of companies which includes Confectionery, Cakes and Biscuits, and agencies in major European locations, U.S.A. and Australia.

The equipment is an ICL 1903A with 64K, discs and tapes operating under a George II system, together with a SCANNER which is to be utilized in the development of on-line systems.

An extremely interesting and challenging 5-year development plan has been launched, covering most aspects of the Company's operations and the Project Leader appointed will be responsible for the development of systems within the financial area.

Great importance is placed upon the ability to develop financial models to aid in corporate decision making, and ideally candidates will have experience of using ICL's PROSPER package.

Initially the team will consist of the Project Leader and one other Systems Analyst with programmers being allocated as and when the need arises.

Benefits include flexible working hours, 28 days' annual plus normal statutory holidays, and a generous relocation scheme where necessary.

For an application form and job description please phone Sheffield (0742) 548381 or write to:

Mr. S. Cookson,  
Personnel Officer

Geo. Bassett & Co. Ltd.  
P.O. Box 80, Jarrow, Tyne and Wear, NE26 1JL

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Southern England To £12,000 + Car  
A qualified, experienced Sales Engineer is required to develop end user sales of a new high speed printer terminal manufactured by General Electric Company, USA.

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A technical Sales Engineer is required to develop the sale of both OEM and end user markets of a new range of paper tape equipment.

## SALES SUPPORT ENGINEER

DATA TERMINALS

Southern England To £8,000  
A qualified Engineer is required to provide technical support for sales team. The position offers sales career prospects.

Please apply in writing with detailed CV to

Managing Director  
GWT AUTOMATIC (UK) LTD.  
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Slough SL1 2BH, Berkshire

# occ computer personnel limited

## Systems Programmer to £7,500

New IBM 3032: CICS/VS: VTAM: VSAM. Extensive terminal network being developed

An organisation serving almost 2 million customers is taking delivery of an IBM 3032 in August to augment its existing 370 equipment. There is an emphasis on the development of on-line systems and it is planned to have over 500 terminals by 1979. The present software environment includes VS1, CICS/VS, VTAM, VSAM and projects during the next 12 months include MVS, database, distributed processing, etc. The planned workload requires an additional Systems Programmer to join the team. Essential experience is at least 3 years in systems programming, with experience in as many of the stated software fields as possible. This is a highly responsible position, and candidates must be well motivated and able to work with a minimum of supervision. Candidates should be of the calibre to progress to Senior Systems Programmer within two years. The conditions of service are excellent, with generous holidays, sickness scheme, pension, etc.  
Ref: 738/CW/Neville John

## Software Programmer to £5,750

Any low level language considered

A Software Programmer is required by one of the U.K.'s leading IBM service bureaux to join a team at the start of a TP project, to develop software for a MEMOREX 1380 Intelligent Control Unit. On completion of this project the successful candidate will either move into the area of systems programming, or IBM software development. The person appointed will have a good technical background, ideally IBM. Experience of ASSEMBLER language would be preferred, although applications from candidates with Usercode, Plan, or any other low level language would be considered.

An allowance will be given for relocation purposes. Other benefits include flexible working hours, a staff restaurant and a contributory pension scheme.  
Ref: 737/CW/Marian Tabone

## ICL SYSTEM 4 & 2900 Programmers & T.P. Consultants £4,000-£8,000

READING (Berks) — A number of vacancies exist with a Software House for young candidates with COBOL and/or USERCODE Programming experience on ICL SYSTEM 4. Consideration will also be given to candidates with an IBM background who have been programming in COBOL and/or ASSEMBLER. The positions are based in Reading (Berks) with an opportunity to work on customer's projects on site. In various parts of the U.K. Long term projects will involve retraining on other hardware such as large 2800 systems (£4,000-£4,500).  
Ref: 524/CW/Renee Nute

A number of vacancies also exist for 2800 experienced programmers to work on conversion packages. The positions are Reading based.  
Ref: 525/CW/Renee Nute

LONDON — we are also looking for Senior professionals with a first class T.P. ASSEMBLER background and/or software experience on large ICL 2800 systems. The ideal person will probably have worked on one of the following: Large scale Teleprocessing, Linking processor to mainframe, Real time operating Systems, (to £8,000).  
Ref: 526/CW/Renee Nute

To apply for any of the above positions or for further information, please telephone the Consultant concerned on 01-242 9355 (office hours) or write to the above address. If it would be more convenient to telephone in the evenings, the telephone numbers are: Neville John — Farnborough (Kent) (68) 52017, Roger Allington — Barkinghamstead (04427) 2299, Renee Nute — 02-574 6372, Sandy Lloyd — 01-691 5166, Marlon Tabone — 01-555 5588.

16 Bedford Row  
London WC1R 4EB  
01-242 9356  
Telex 21120

## Real-time Programmers £4,000-£6,000

Berks - Herts - West London

There are opportunities at the above locations for people with mini or micro computer experience to work for a computer manufacturer. Applicants should preferably be graduates with at least 2 years' Assembler real time programming experience which can be based on any mini computer. In addition any application experience would be useful, particularly in the area of communications. We would also be interested to hear from people with microprocessor experience. These vacancies exist for all levels of programmers to Project Leaders. Salaries in excess of the figures quoted could be negotiated for exceptionally well qualified applicants. There are also openings for recently qualified graduates with degrees in Computing science who wish to train as programmers.  
Ref: 114/CW/Sandy Lloyd

## SALES & TECHNICAL SUPPORT London - Sales Support to £6,000 Reading - Technical Support £3,300-£5,500

Our clients are looking for experienced junior project managers and sales support staff to be responsible for providing system implementation support and specific pre sales support for a number of large manufacturing customers. The positions are London based and call for specific knowledge both hardware and software of one or more of the 1900, 2803, 2800 DME ranges.  
Ref: 522/CW/Renee Nute

Technical support positions based in Reading (Berks) are open to experienced personnel with a background in operating and/or Systems or Programming on ICL 1900, 2803 or 2800 ranges.  
Ref: 523/CW/Renee Nute

## Senior Systems Analysts to £8,000

European network, IBM 370's and PDP 11's

A major manufacturer of industrial chemical products has a Europe-wide network of PDP 11/40s and medium sized IBM 370s operating in a distributed processing environment. Senior Analysts are urgently required for the London installation to develop and implement business systems for the six main manufacturing locations in Europe. Applications will cover accounting, marketing and other commercial systems. Successful candidates will have at least four years' good systems experience. A graduate would be preferred. Although the positions will be based in London, there will be a certain amount of European travel involved. The ability to converse in a European language would be an obvious advantage. A relocation package will be offered. Other benefits include flexible working hours, a staff restaurant, four weeks holiday and a contributory pension scheme.  
Ref: 738/CW/Marian Tabone

## GERMANY to c £14,000

Our Client, a European based consultancy organisation currently wishes to recruit a number of personnel for projects based in various German locations. Positions will be offered on a 1 or 2 year negotiable contract basis, some of which may offer opportunities for tax free earnings during the contract period. Knowledge of the German language is useful but not essential.

## Basic Software

Located in Southern Germany, Software Designers and Programmers are required to develop, implement and test Basic and Applications software for a new range of mini and mainframe hardware which is to be used on a worldwide basis for process control and real time commercial and technical applications. Basic software experience could include operating systems, compilers, database communications, macro libraries, etc. Programming experience in a low level language or Algol is desirable.  
Ref: 351GA/CW/Roger Allington

## PDP 11

Ideal start would be September 1978. Experience using PDP 11 hardware is essential preferably under RSX11D/M or RT11, using Fortran or Macro 11. Applications are mainly on-line and real time commercial systems.  
Ref: 351GB/CW/Roger Allington

## TC 800

Analyst Programmers with Olivetti TC800 experience are required to develop, from design through to implementation, commercially oriented applications involving on-line and real time processing.  
Ref: 351GC/CW/Roger Allington

## Univac 1108

Fortran required for technical applications being developed in Southern Germany.  
Ref: 351A/CW/Roger Allington

## IBM-IMS

Commercial projects in Holland and Germany require PL1/Cobol experience. DL1 and systems generation experience would be useful.  
Ref: 351B/CW/Roger Allington



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## EXCELLENT OPPORTUNITIES FOR SYSTEMS DEVELOPMENT STAFF

### LARGE COMPUTER CONSULTANCY LONDON BASED

Our Clients, an international consultancy, are especially strong in the U.K., where they are market leaders and enjoy the highest of reputations. They are sustaining rapid growth and expect to be one of the world's leading computer services organisations by the early 1980s. Their services include the development of applications systems, the provision of turnkey operations using mini computers, computer consultancy, facilities management and education. Providing services for a large number of organisations both within the private and government sectors, they have particular expertise in distribution, manufacturing, insurance, banking and finance.

We have been retained to find experienced SYSTEMS ANALYSTS and PROGRAMMERS based in London, with the following attributes:

### SYSTEMS CONSULTANTS TO £7,250

#### EITHER:

- ★ Experience of managing a team of programmers and senior programmers.
- ★ Experience in computer system design and documentation.
- ★ Knowledge of a wide range of commercial systems.

#### OR:

- ★ Detailed expertise in a specific technical area e.g. use of telecommunications, data base, distributed processing etc.

### SENIOR PROGRAMMERS TO £6,250

- ★ Capability of supervising 2/3 programmers.
- ★ Experience in writing program specifications.
- ★ Reasonable knowledge of an application area.
- ★ 2 years' programming experience, preferably in COBOL, RPG, BASIC or CORAL.
- ★ 'A' levels or equivalent.

This is an ideal opportunity for you to join a dynamic team with excellent career opportunities. Although the majority of projects are within the London area, opportunities do exist for you to undertake European and other international assignments should you so wish. If you work away from home, generous allowances are paid.

Interested applicants should contact ROY HIGHFIELD and interviews will be arranged as soon as possible in the strictest confidence.

**HUTTON EXECUTIVE SELECTION LTD.**  
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# Hutton

SPECIALIST RECRUITMENT CONSULTANTS

## ★ JOB SATISFACTION

### PL/I PROGRAMMER W. LONDON AREAS

As part of a prestige international group of companies, our client is now recruiting for programmers with 2/3 years' PL/I experience and hopefully some ASSEMBLER for the development of manufacturing systems on the IBM Series/1 minicomputer.

- ★ Excellent opportunity to be trained on mini computer
- ★ Versatility of IBM Series/1 in relation to IBM mainframe
- ★ Working with up-to-date technology
- ★ Excellent career opportunities including chance of working with microcomputers
- ★ Salary to £7,000.

Ref 1597

### SNR. ANALYST/PROG WEST LONDON, BERKS.

International company with outstanding reputation for efficiency, growth and investment are seeking senior analyst programmers to work within IBM 370 installation. Good experience of PL/I or COBOL or ASSEMBLER is essential together with ability to work on own initiative and supervise staff. Working on teleprocessing and time sharing systems with opportunity to work on small business machines. Company offers:

- ★ Exciting growth potential.
- ★ Excellent promotional prospects.
- ★ Non-contributory life assurance, sickness and pension scheme.
- ★ Good working conditions.
- ★ Salary to £8,000.

Ref. 1568

### SENIOR ANALYSTS MIDDX.

Our client, a major organisation situated close to both M4 and M3 motorways, is seeking a senior analyst to act as PROJECT LEADER on a wide range of applications. If you have approximately 3 years' systems experience, preferably in ICL 1900 series environment, and are able to demonstrate a professional approach to project management, apply NOW. Company offers:

- ★ Job security with a prestige concern.
- ★ Responsibility.
- ★ Excellent working conditions.
- ★ FREE Lunches, FREE Life Assurance.
- ★ Salary £8,500 + COMPANY CAR.

Ref. 1629

### SYSTEMS ANALYST LONDON

Our client, a prestigious Merchant Bankers, are seeking a Systems Analyst who has financial/banking environment experience. They retain IBM 370 under OS but will consider other hardware experience. Company offers:

- ★ Full banking benefits including subsidised mortgage.
- ★ Excellent working environment.
- ★ Job security with prestige concern.
- ★ Salary £7,500.

Ref. 1584

## ★ SALARY

### JNR. PROGS. LONDON

Challenging careers await persons with approximately 12 months' programming experience on ANY MACHINE, ANY LANGUAGE with drive and enthusiasm who want to follow a positive career path. Opportunities as follows:

- ★ TRAINING in TP and database
- ★ Development work on new sophisticated systems
- ★ Career progression with forward thinkers.
- ★ Up-to-date technology.
- ★ Salary to £4,500

Ref 1550

### ICL PROGS. LONDON

Due to development of their advanced computer systems, successful D P services dept. seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years' ICL COBOL experience. Company offers:

- ★ Opportunity to join at senior level
- ★ Training on IDMS database.
- ★ Development to analysts
- ★ Applications in various areas providing an absorbing and interesting career
- ★ Excellent perks include flexible hours and 6 WEEKS' HOLIDAYS.
- ★ Salary £5,500.

Ref. 1549

### SYSTEMS ENGINEER W. GERMANY

World-wide manufacturing company with offices in Frankfurt seeks engineer for sophisticated communications systems. Ideal applicant should have in-depth experience of communications and message switching on any mini. Good knowledge of GERMAN is essential. Company offers:

- ★ Relocation expenses.
- ★ Good career prospects in this company with excellent growth potential.
- ★ Generous fringe benefits.
- ★ Salary to DFL 60,000 (£15,000)

Ref. 1578

### PROGRAMMERS MIDDLE EAST

We would like to meet computer professionals on behalf of our clients with around 4 years' ICL 1900/2900 experience to discuss long and short term assignments in the GULF area of the Middle East.

- ★ Scope in a variety of areas.
- ★ Conversion plans.
- ★ Accommodation and expenses paid by company.
- ★ Renewable assignments.
- ★ Salary c. £12,000 TAX FREE.

Ref. 1588

## ★ CAREER OPPORTUNITY

### MINI PROGS. HANTS.

Our client is a major British company with business interests in many areas. They seek programmer with at least 18 months' DEC PDP II and BASIC + experience. This hardware is newly installed and thus offers a chance to become involved in the development from the beginning. Company offers:

- ★ Wide range of projects
- ★ Flexible hours
- ★ Excellent career prospects
- ★ ANNUAL BONUS
- ★ Salary c. £6,000 p.a.

Ref 1586

### PROGRAMMERS MIDDLE EAST COUNTRIES

Our client is a major international organisation with offices throughout the world. They seek programmers and analysts in BAHRAIN & JEDDA where their market is growing strongly. Ideal applicants will have COBOL and/or NEAT experience on NCR small business machines to work on an interesting variety of projects in a financial and commercial environment.

- ★ Renewable one year permanent contract
- ★ Fully furnished accommodation provided at the company's expense.
- ★ 30 days' LEAVE per annum
- ★ Salary paid in Bahrain Dollars c. £12,000 TAX FREE

### MINI PROGRAMMER CITY

Our client, a well-established financial group, is setting up a new company to deal with a rapidly expanding area. Super opportunity for programmers with any mini experience, preferably using BASIC, but training given. If you want a CHALLENGE and to be involved from the start — PHONE NOW!

- ★ Training in RSXII & RSTS.
- ★ Great career prospects — promotion on merit.
- ★ Banking perks, free life assurance and L.V.s.
- ★ Salary to £8,000.

Ref. 1562

### PROGRAMMER ESSEX

Well-known manufacturing concern retaining IBM 360 hardware seek programmer with approximately 2 years' ASSEMBLER experience (Cobol an asset) to work on applications in two separate divisions, i.e. wholesale and manufacturing. Currently installing Burroughs minis in all their depots for distributed processing.

- ★ Training on COBOL.
- ★ Opportunity to go on to MINIS.
- ★ Excellent career opportunities.
- ★ Flexi-time, profit share, staff canteen.
- ★ Salary to £5,300.

Ref. 1622

For details of the above positions please telephone our London office 01-734 0152/3010 24 hours

### SALES PERSON

As Europe's largest suppliers of contract computer personnel to Holland, we require an additional sales person for our Amsterdam office. The successful applicant will have good computer experience, preferably with a sales background. He or she will be self-motivated and keen to travel. Remuneration will include a generous guaranteed basic income, and a substantial commission. We will expect a successful person to earn in the range £15-£25,000 p.a. A car will be supplied.

### HOLLAND

Please reply to:

The Directors Knight Programming Support Ltd. 27 Noel Street, London, W1

## CONTRACT DIVISION

### OVERSEAS

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**LEWISHAM**  
South London and Croydon Education Department  
**Senior Systems Analyst**  
Ref CE263/CW  
£5494-£6055 (under review)

We are about to embark upon a number of interesting and varied new projects and are currently increasing our Systems Staff strength. A vacancy exists for an experienced Analyst capable of leading a project team through all stages of development to final systems implementation. Seven years' relevant experience is required and candidates should be able to demonstrate a record of successful achievements.

We operate a 35 hour time week, provide over five weeks' annual leave, a subsidised restaurant, and free car parking facilities.

The installation comprises an IBM 370/138 processor and the usual peripherals, and operates under DOS/VSE.

**Senior Programmer**  
Ref CE274/CW  
£5494-£5797 (under review)

Tired of commuting in the rush hour? How about joining us? We provide first time working hours, over five weeks annual leave, a subsidised restaurant and free car parking facilities at Catford, South East London.

We are looking for a capable Senior Programmer who has the potential to lead other programmers within a project team. Our project teams are responsible for the design and implementation of a wide variety of challenging systems which are written in COBOL for an IBM 370/138 computer. As Senior Programmer you would be expected to have or acquire knowledge of BAL and COBOL, provide guidance to programmers under your control and assist with the training of junior staff.

If you think one of these is the right opportunity for you call Lucy Harris, Systems Manager on 880 4343, extension 68.

**Application form, returnable by July 21st, and detailed job description from Chief Personnel Officer, Town Hall, Catford, London SE6 4RU or telephone 01-890 7866 (24 hour Answerphone service) quoting appropriate reference and job title.**

**SALOP COUNTY COUNCIL**  
**SENIOR ANALYST/PROGRAMMER**

Salary up to £5,512 per annum (Phase 3 pay award pending 1st July, 1978)

These additional posts are required to enable the Council to embark on a major new development program. The duties will include the detailed analysis, design, programming, implementation, and maintenance of the whole of minor projects or part of major projects. The positions will provide an ideal opportunity to gain team leadership experience over a wide variety of applications in an expanding installation.

The Council operates an IBM 370/138 computer with a substantial remote terminal network which provides a service to both County Departments and District Councils. Major enhancements to both hardware and software are planned. The emphasis of the new development is on interactive management information systems, and these posts will play a key role.

Salop has plenty of cheap housing in predominantly rural surroundings, and generous assistance with removal expenses will be given in approved cases.

Applicants should have several years' good systems and programming experience. Although further training opportunities to the Salop computer will be given, experience of PL/I, Assembler, DC/1 or CICS would be an advantage. Vacancies also exist for applicants with shorter experience on similar lower graded posts.

Application forms and further details may be obtained from the County Treasurer, Shirehall, Shrewsbury, Salop SY2 8ND (telephone Shrewsbury 222335), returnable by 18th July, 1978.

**NORTH MIDLAND CO-OPERATIVE SOCIETY LIMITED**

**COBOL PROGRAMMER**

We require a programmer with a minimum of 2 years' experience in COBOL and a knowledge of RPG 11 would be advantageous.

We operate an ICL 2903 with 2 SDS 80s and 5 D.D.E.s, located at Telford, Stoke-on-Trent.

We are a rapidly expanding retail organisation with a trading area in North Staffordshire and Cheshire.

Salary is negotiable.

Applications to the Personnel Officer, North Midland Co-operative Society Limited, 10 Newmarket Street, Stoke-on-Trent ST6 3QG.

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**The Royal Borough of KENSINGTON AND CHELSEA**  
**CONTROL CLERK**  
Up to £3438 p.a. inc.  
An enthusiastic person required to join our Computer Operations Department which is running an IBM 370/138 under DOS/VSE POWER and CICS. Minimum of an month's computer experience preferred, possibly gained on a similar system. 36 hour week. 21 days holiday, subsidised restaurant and financial sports and social facilities.  
Phone Nigel Frost on 837 6444 Ext. 878 for further information.  
Rec: 885.

**EUROPEAN SOFTWARE SUPPORT**

WORDPLEX is an international company which markets one of the most sophisticated ranges of stand-alone and multi-user word processing systems and is the European market leader in this area.

The European Support Centre for WORDPLEX is based in London and provides technical and marketing support to the WORDPLEX distributors in almost every European country. The small Software Support Group requires two more people.

**SUPPORT ANALYST**  
**£5000-£6500**

We require a Support Analyst to work with our distributors on Pre- and Post-Sales support of large accounts. Applicants for the position must be prepared to travel extensively in Europe and should have a good software background. Some knowledge of European languages would be an advantage.

**SOFTWARE PROGRAMMER**  
**£5000-£6500**

A Software Programmer is required to work on further developments on the system. Applicants must be well experienced in Assembler languages, preferably on mini or micro processors, and should have experience in operating systems and communications programming. Applicants should be prepared to travel frequently in Europe.

In addition to salaries offered the positions carry an excellent benefits package including Life Assurance, relocation assistance and an annual bonus.

If you are interested please write with brief career details to: Software Support and Development Manager, WORDPLEX EUROPE, Station Approach, Stonebridge Park, LONDON NW10 4UY, Tel: 01-903 9655.

**wordplex europe**

**Senior Programmer**  
(F76) £3,987-£4,735 inclusive  
(salary award pending)  
(salary grade AP 4/5 plus outer fringe area allowance and salary supplements)

This is a new post requiring a person with at least three years' experience of COBOL who has the ability to lead a small programming team. Duties will include an involvement in Systems design and the maintenance of programming standards.

The Council will shortly take delivery of a Honeywell 64/20 and conversion of existing systems from Series 200 is now under way. The new equipment will enable further systems to be developed and communications facilities to be introduced.

This post attracts 100% removal expenses, generous assistance with resettlement expenses and temporary accommodation where appropriate.

PLEASE WRITE OR TELEPHONE FOR JOB DESCRIPTION AND APPLICATION FORM TO THE PERSONNEL OFFICER, CRAWLEY BOROUGH COUNCIL, TOWN HALL, CRAWLEY, WEST SUSSEX RH10 1UZ, TELEPHONE CRAWLEY (0293) 28744 Ext. 122 (24 HOUR ANSWERING SERVICE).

CLOSING DATE 18th JULY, 1978.

**CRAWLEY BOROUGH COUNCIL**

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**£4,000-£12,000**

Prescot Computers have helped many computer professionals to obtain employment in South Africa and Australia and we have now expanded our coverage to New Zealand. Prospects are particularly good for Programmers, Systems Analysts, Analyst Programmers, Consultants and Sales People. Salaries generally range from £4,000 to £12,000 p.a.

We have just returned from an extensive trip to South Africa, Australia and New Zealand and would like to speak to you if you are interested in working in these countries.

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Why not telephone Chad Stolper on 01-242 2142 for an informal discussion. Alternatively, if you prefer write to him at

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invites applications for the position of

**SENIOR COBOL PROGRAMMER**

The successful applicant for this permanent position will join a small team and will be responsible for maintaining and enhancing existing programmes.

The current main application is a Micro-Computing on-line system and in the near future the present Honeywell 61/58 will be up-graded to a 62/40.

At least 3 years knowledge of Cobol programming, essential and experience of Cobol programming desirable.

Replies with full details in writing and marked 'confidential' to:

The Secretary,  
Norwich Union Life Insurance Society,  
P.O. Box No. 112,  
Dawson Street, Dublin, 2.

**canterbury City Council**  
**Senior Systems Analyst/Programmer**

APS/SOI £4343-£5065 (incl.)  
(pay award pending)

Applications are invited for the above position from suitably qualified and experienced persons. The Council operates an ICL 1901A computer at the present time but this is to be replaced in October 1978 with an ICL 2903 using SDS 80s and VDUs linked by a 7502 to the mainframe. The new computer will be on the outskirts of the attractive City of Canterbury. The position offers a first class opportunity for a computer professional to obtain job satisfaction from working on complete projects and also to become involved in the Council's plans for the implementation of on-line systems.

A Casual User Car Allowance is payable. Consideration will be given to housing accommodation and a generous disturbance allowance scheme is in operation.

Closing date 7th July, 1978 Interview date 17th July, 1978.

Application forms may be obtained from the Personnel Officer, 3 Marlows Avenue, Canterbury, Kent CT1 2GN. Telephone: Canterbury 57585 Rm. 12.

**PROGRAMMERS ANALYSTS PROJECT LEADERS**  
**£4,500-£8,500**

A branch of the largest supplier of DEC mini-computers in Europe require experienced computer staff to design and implement commercial systems using on-line techniques on DEC hardware.

A knowledge of RSTS, BASIC, DIBOL, COBOL and SQUASH is desirable. Don't let your knowledge of other machines prevent you learning something new. Our offices are in Thames Ditton, Surrey, which gives easy access to London and the South East where most of our projects are concentrated.

Other benefits include Contributory pension scheme, travel expenses and discretionary bonus scheme.

For more information and application form please write to Gamma Business Systems, 27 High Street, Thames Ditton, Surrey, or ring Tony Simpson, 01-388 7236 (daytime) or 01-458 7483 (evenings).

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**Systems Programmers**  
**Exciting career opportunities for Software Specialists in Ford's Product Development Group**

Ford's Research and Engineering Centre is located at Dunton in South East Essex. Here, automotive professionals work on designing and engineering the cars of tomorrow.

Our computer service provides support to design and test engineering activities in Britain, Germany and Belgium. To meet targets in line with Ford's drive into the 80s the data processing requirements of these locations are increasing every year. In order to meet these demands we now wish to appoint 2 experienced Systems Programmers to strengthen our team of software specialists.

If you are a software professional with a degree or equivalent, or alternatively have at least 3 years experience of programming COBOL or FORTRAN, this is an ideal opportunity for you to broaden your computer experience by working with the Honeywell GCOS operating system. Our current hardware is a 256K Honeywell 8060.

These are challenging positions in which you will be involved in the extension and development of our Honeywell GCOS operating system to meet our own specific needs, as well as resolving problems of usage and malfunctions if and when

they arise. The job will also involve you in the role of "consultant" advising users, engineers, analysts and supervisors on the effective utilisation of the system. Therefore, you must demonstrate the ability to communicate lucidly and effectively in detail at all levels. You will also be involved in a limited amount of travel within the UK and will visit Cologne in Germany occasionally. The ability to speak some German would naturally be useful, but this is not an essential qualification.

These jobs offer genuine promotion prospects either within the computer activity or in other related areas. We offer initial salaries of up to £8,500 p.a., dependent on qualifications and experience, together with a full range of fringe benefits including Ford's Special Car Purchase Plan and relocation assistance, where appropriate.

If you are a Systems Programmer looking for better rewards and greater professional scope, then please write, giving full personal and career details to: Paul Kite, Staff Personnel Officer, Room 15/182B, Research and Engineering Centre, Ford Motor Company Limited, Langdon, Basildon, Essex.

**REQUIRED MINI COMPUTER PROGRAMMER**  
with one to three years' experience in Fortran and / or Assembly language, preferably on Data General equipment.

Position will require specialised training in Oilfield related work and will be U.K. based, with 15-25% international travel necessary.

Applications in writing only, to:  
Mr. C. R. Hacker, Manager Computer Services  
Sperry-Sun International Inc.  
Steam Mill, Great Yarmouth, Norfolk NR31 0HP

**ANALYST/PROGRAMMER POWER STATION SIMULATION**  
**LEEDS**

The North Eastern Region of the Central Electricity Generating Board designs Real Time Operator training simulators of power station plant at their premises in Central Leeds. The simulators are for installation in Electricity Authorities both in the United Kingdom and throughout the world.

**IF YOU HAVE:**

- A sound working knowledge of FORTRAN.
- The ability to communicate effectively with engineers of other disciplines.
- BCS Parts I and II or an appropriate degree.
- A broad interest in engineering.

**WE ARE OFFERING:**

- "Hands-on" operation of a large mini-computer.
- Opportunities for home and international travel.
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- The opportunity to develop your own ideas from concept to implementation.

**SALARY RANGE:**  
£4231 to £8215 p.a.  
Point of entry depending on qualifications, experience and training.

**HOW TO APPLY:** Please write giving brief details of qualifications, experience and salary to:

The Regional Personnel Manager,  
Central Electricity Generating Board, North Eastern Region,  
Beckwith Knowle, Otley Road, Harrogate HG3 1PS,  
quoting reference SVN/514. Applications should arrive not later than Friday 21 July, 1978. CW

**MODCOMP**  
**MINICOMPUTER PROGRAMMER**

required by international computer manufacturer to implement MANUFACTURING ORDER PROCESSING and INTEGRATED ACCOUNTING SYSTEMS for their European Operations.

Sound experience in COBOL and FORTRAN is essential, together with practical knowledge of accounting procedures, including profit-loss accounts and balance sheet.

It is expected that you will make a real contribution in the setting up of the manufacturing computer systems.

Commercial computer bureau experience would be an added advantage. Location is in WOKINGHAM; some travel to U.S.A. and Continent could initially be involved.

SALARY will naturally depend upon your capabilities and relevant experience. MODCOMP offers very competitive remuneration packages.

Please send details of your qualifications and experience to:  
G. A. Klyn  
**MODULAR COMPUTER SERVICES INC.**  
The Elms, Broad Street  
WOKINGHAM, BERKSHIRE

**LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY**  
**Control Systems Design**

Applications are invited from electrical and mechanical graduate engineers for RESEARCH ASSISTANTSHIPS tenable up to 2½ years under a Department of Industry contract in the University's Department of Engineering Production. The project is concerned with the production of software packages for industrial designers of high performance servo mechanisms. Previous experience in interactive computing, electric or hydraulic drives would be an advantage. The successful applicant may be able to register for a higher degree.

Salary within scale £3189-£4130 (under review). Further details and application forms from Professor R. Bell, Department of Engineering Production.

Loughborough Leicestershire

**Further your Career in Computers**

If you have at least 18 months' experience in an ICL multi-programming environment operating under "GEORGE 2" we can offer you career prospects as a COMPUTER OPERATOR with commencing salary on a career grade according to experience eventually rising upon recognised proficiency to £4508 plus 1977 Supplement. Will operate on ICL 1902 computer on a two-shift basis 0800-1800 hrs / 1500-2300 hrs Monday to Friday.

The post is located at the Town Hall, Euston Road, NW1 1LSD to good main-line and tube / bus service. Ref: IC/81/CW

For application form please telephone our 24-hour recruitment answering service 01-637 9008 or send postcard to the Chief Executive, London Borough of Camden, Town Hall, Euston Road, London, NW1 2BU, stating post and appropriate reference number.

**Camden - an equal opportunity employer**

Applicants are considered on the basis of their ability for the post regardless of sex, race or marital status. Also registered disabled persons with the necessary attributes are welcome to apply.

**ANALYSTS & PROGRAMMER/ANALYSTS TO £8000**

Whether you have seen many years' experience in systems and are looking for greater variety of work on interesting and challenging projects - or whether you are a GOOD programmer hoping to move up the scale into analysis...

We have OPPORTUNITIES in Surrey, Sussex, South West London & the City

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With at least 2 years' COBOL, PLAN or ASSEMBLER language to work in IBM/ICL/BURROUGHS or MINI environments.

● IBM people with CICS - salaries to £8000  
● ICL 1900/2900 series COBOL programmers, preferably with FILETAB can expect between £4650 and £6050

Senior people, with the potential towards systems consultancy and major project management. Men and women with a solid background in systems design are required by a number of our clients to take on responsibility for implementation and development projects. Experience in FINANCIAL, BANKING or INSURANCE fields an advantage.

Full details can be obtained from  
COLIN SHINGLETON on 01-948 4424  
Meteor Computer Consultants Ltd.  
Barry House  
20/22 Worple Road  
Wimbledon SW19



# Programmers and Analyst/Programmers

London, Manchester and Birmingham.

up to £6,000

Our client, one of the leading computer services organisations in Europe, is continuing to expand its development group and therefore has vacancies for Programmers and Analyst/Programmers to work on a number of varied commercial projects.

Candidates should have at least two years in the design and programming stages of commercial systems such as accounting, stock control, production, etc. A background in high-level languages particularly COBOL, PL/1 or RPG 2 would be an advantage and typical applicants could have experience on IBM or DEC computers. For the Analyst/Programmer positions it is essential that applicants have been involved in the design of at least one commercial application. Knowledge of on-line, real-time and teleprocessing would be an asset.

Ability to communicate with users and clients is desirable since these appointments involve customer contact.

Salaries are negotiable according to experience. Large company benefits. Opportunity to travel. Excellent career progression.

If you would like an informal discussion about the Company and vacancies please telephone:-

Jim Baker,  
JAMES BAKER ASSOCIATES,  
International Personnel Consultants,  
16 Maddox Street, London W1. Tel: 01-491 4478.

## SOFTWARE SPECIFICATIONS ENGINEERS

Sperry Gyroscope recognises the growing importance of the definition of software requirements and the maintenance of control documentation, associated with the complex electronic systems currently being designed.

Interesting positions are available in a rapidly expanding software department which is dedicated to a major defence project. The work comprises writing and updating Software Requirements and Test Specifications and liaising with other departments responsible for equipment and system design and operations.

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Sperry offers salaries to match experience, opportunities for career advancement, generous relocation expenses where applicable, and a thriving sports and social club.

For an application form, write to or telephone Don Manning, Sperry Gyroscope, Downshire Way, Bracknell, Berks RG12 1JL. Tel: Bracknell (0344) 3222. Quote ref. CW/6776



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Ideally you will be outgoing with at least five years' commercial experience. Awareness of business issues together with experience of financial applications would be of particular relevance. Successful applicants will receive extensive training on the company's products and will become well versed in their approach to business.

24-hour answering service

Please telephone for a confidential discussion or write to:  
30 Fleet Street, London EC4Y 1AA  
01-353 0981

## CONTRACTS HOLLAND

### Systems Programmer

With previous experience in a supervisory capacity or as a Project Leader. To work in Amsterdam for a minimum of one year.

### Programmer

With a minimum of three years' HONEYWELL LEVEL 86 and G.MAP experience to work in Amsterdam for three months.

### Programmers and Analysts

With sound ICL backgrounds. To work on various projects in Europe. Use of a foreign language would be an advantage.

## LONDON AND HOME COUNTIES

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Programmer with a minimum of three years' experience, any machines. Preferably with a knowledge of Banking applications. Six months' contract. Immediate start.

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Experienced programmer required. A knowledge of UNIVAC DATABASE would be an advantage. For three months commencing end of July.

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Programmers with a minimum of three years' 6700 experience to work on various projects in London and the Home Counties.

For further details please contact Bridget Kitchie

RENDECK LIMITED  
100 New Bond Street  
London W1Y 8LF  
Tel. 01-629 5438



## WEST WILTSHIRE DISTRICT COUNCIL

RPG 11

### PROGRAMMER / ANALYST

SALARY Approx: £5,300 to £5,650 including all Supplements and Shift allowances

The Council operates an ICL 2903 computer with F80s and a 7602 based communicating network providing a computer service throughout the authority.

The installation is operational between 7.30 am to 7 pm by means of two shifts, i.e. 7.30 am to 4 pm and 10.30 am to 7 pm.

The machine is due to be upgraded to 2904 in late summer and the Council wishes to appoint one experienced RPG 11 Programmer wishing to gain experience in the Analyst sphere. The person appointed will have at least eighteen months experience of RPG 11, and a detailed knowledge of ICL 1900 to 2903 Software/Utilities will be regarded as equally important.

If you would like to discuss any aspect before submitting an application form, please contact D. BENFIELD, Computer Manager on Trowbridge (02214) 63111 ex. 121.

The West Wiltshire District Council area is situated in a pleasant rural location with easy access to the towns of BATH/BRISTOL and the M4/M5 motorways with reasonable house prices. Removal and lodging expenses can be provided in appropriate cases.

Application forms are available from Personnel Officer, WEST WILTSHIRE DISTRICT COUNCIL, BRADLEY ROAD, TROWBRIDGE, WILTSHIRE BA14 0RD or by telephone Trowbridge (02214) 63111 ex. 118 (Mrs. Tilley). Closing date 18th July 1978

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POSITION	SALARY	EMPLOYER	LOCATION	HARDWARE ENVIRONMENT	SOME OF THE QUALIFICATIONS	REF. NO.
Analysts	to £7,500 + Free lunches + stores Discount	Retail Trade	London	IBM DOS	Analysts with the potential to be project managers are required to lead a team of analysts and programmers to develop data base and P.O.S. projects.	27/1
Software Technical Instructors	to c £7,000 + car allow + +	Manufacturer	NW London	-	1+ years' computer educational instructing and course development work or equivalent experience. Working knowledge RPGII and all applications software at functional capability level.	27/2
Systems Analyst	c £8,000 + mortgage + bonus + Free lunches	Insurance	EC2	ICL 1900	Urgently required - analysts with 2 years+ experience to work on financial/insurance systems in an on-line environment.	27/3
Senior Analyst/Project Manager	£12,000++ TAX FREE ACCOM ++	International Airline	Middle East	IBM DOS VS POWER	Extensive experience of airline schedule planning. Previous experience of operational research in essential and statistical background of distinct advantage.	27/5
Technical Analyst/Programmer	to £7,500 +	Software House	London	Minis/Micros	Excellent opportunity for programmer/analysts with 4 years+ experience of assembler/machine code to develop software products on a variety of machines.	27/6
Software/Package Specialists	to £7,000 +	Bureau	W1	PDP 10	Excellent career prospects for people with experience in one of the following areas: PDP8/11s, networks, message switching, communications, etc.	27/7
Consultant	A1 NEG.	Electronics Industry	Amsterdam	-	This European marketing HQ requires a CAD/CAM specialist giving sales support in Europe. Experienced in numeric control of machine tools. Free to travel.	27/8
Analysts & Programmers	to £7,500 + fringe benefits	International Banking	City	IBM & Minis	Exciting career prospects for DP professionals with a minimum of 18 months' COBOL/RPGII experience to develop on-line, real time, banking applications.	27/9
PLI/COBOL Programmers/Analysts	to £6,500	Bureau	N. London	IBM OS	PLI/COBOL programmers urgently required to join this expanding organisation to work on a wide variety of projects using data base and terminals.	27/10
Programmers	to £7,000	Electronics Industry	N. Surrey	Any	First-class opportunities for all levels of programmers to work on advanced software/hardware systems in a challenging and rewarding role.	27/11
Programmers/Analysts	to £8,000 +	Software Services	City	PDPH	Programmers with a sound background preferably on PDP equipment required to develop interesting real-time and communications systems.	27/12
Programmer/Analysts	to £6,500	Building Industry	WC1	ICL 1900	Programmers with 3 years+ ICL COBOL and preferably some systems experience urgently required to develop on-line commercial systems.	27/13
Analyst/Programmers	to £6,000	Insurance	NE Surrey	IBM-DOS	Openings for self-starters with a minimum of 18 months' COBOL. Excellent career prospects within this progressive organisation.	27/14
Programmers & Analysts	to £7,000+	Software House	Central London	Burroughs	Excellent opportunities for programmers with 18 months+ COBOL experience to work on a wide variety of commercial projects.	27/15
Contract Programmers	from £180 per week +	Software House	London H. Counties. Brussels	Varies	PDP Basic+, RPGII, IBM COBOL, OS, MARK IV, 1900 BH COBOL, Burroughs B80, PLI, OS. Contracts available now.	27/16
Scientific/Technical Programmers	to £7,000 +	Technical Consultancy	Various S. of England	Minis/Micros	Scientific/technical programmers with minimum 2 years' assembler and preferably ALGOL, COBOL, FORTRAN, urgently required to work on a wide variety of projects including process control, simulation, communications. Excellent career prospects.	27/4

### CENTRAL LONDON & MIDDLE EAST

## PROJECT LEADERS ANALYST/PROGRAMMERS PROGRAMMERS

### UK SALARY

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to £6,750+

to £6,500+

+ PROFIT SHARE BONUS

Our clients, an International Software House with Headquarters based in Central London, have signed several turnkey projects overseas and are urgently seeking ambitious people to develop their systems in London. In view of planned expansion staff are required at all levels to join Project Teams to implement systems on site. Applications range from general commercial systems to the more specific: airlines, hotels and financial on-line systems.

### Project Leaders

With a background of analysis and programming and experience in leading a team of at least six. Capable of organising turnkey systems including implementation and training.

### Analyst/Programmers

Experienced in writing detailed systems and programming specifications and able to deal with first time users in an overseas environment.

### Programmers

Who can cope with challenging projects within this Software House. Languages are immaterial although much of the work is based on Minis and a knowledge of BASIC would be an advantage.

Generous overseas allowances and accommodation are available whilst working abroad.

Interviews are being held throughout the months of July and August and offers will be made to successful candidates within one week.

27/17





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
If you are already a successful salesman within the data processing industry, or feel you could be, we would like to talk to you about high salaries with the industry leader; about a big company benefit package; about possibilities for contact with the most important and largest enterprises in the U.K. and Europe. Above all, about promotion opportunities within the fastest growing software organisation in Europe.

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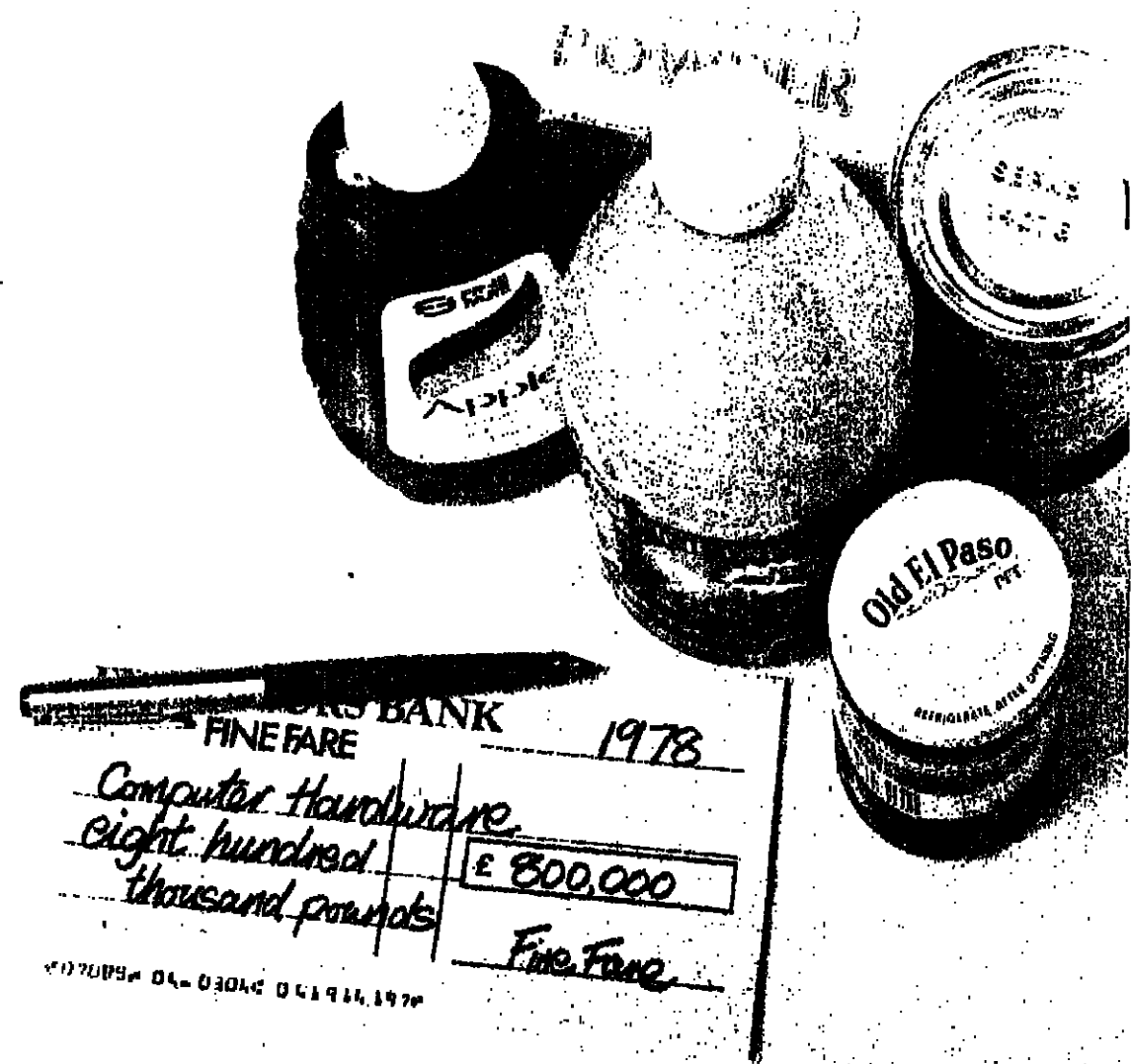
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## THE SALES BIT

## Start with the phone operator

SALESMEN will often hear the old selling adage, "start at the top," but, despite this heartfelt plea, with more often than not, commence their selling cycle at what ever level fate inflicts upon them.

In practice, it is certainly best for a salesman to start his selling at the chief executive level wherever possible, but it is generally advantageous for the very first contact to be at a much lower level in the hierarchical league table, namely the telephone operator.

The importance of being well prepared before every stage of the sales cycle has been emphasised in this column many times, and preparation for the first contact is probably the most crucial event of all.

The salesman can collect a vast array of company information from Dunn and Bradstreet, Kompass and The Stock Exchange Yearbook, but they have little to contribute when the salesman needs answers to questions like "Which is the best day to catch the financial director?" or "What is the name of the new managing director?"

When it comes to information on organisation, names, locations, products and habits of all kinds, a salesman's best friend is his prospect's telephone operator.

If the salesman wants to be sure he gets the MD's name and initials right, as well as the company name and address, just ask the telephone operator. She will catch him, as well as the names of his closest aides, and if you are really charming she might even give you an outline of the company's primary products and markets. Be sure to ask her about the company's current involvement with computers - she will almost certainly have some idea of the situation.

In most organisations, the person who has the greatest amount of verbal interaction with the largest number of people is the telephone operator. Very often she also has contact with the secretaries of senior executives, so she tends to know more about what is happening within the company at the people level than anyone else, including the MD. So, not only at the beginning of the sales negotiation, but also at many subsequent stages, the telephone operator can be the salesman's greatest ally.

An essential fact to bear in mind is that telephone operators, secretaries, etc. do not generally provide helpful information as a result of being "chatted-up." I have seen many salesmen at work in this respect and most efforts have been pathetic. For every Sean Connery employed in selling within the computer industry, there are probably 50 Woody Allens! Like most aspects of selling, there is only one reliable approach and that is based on truth and common sense.

The first phase is a simple request for assistance. "I wonder if you can help me please? I believe you are the person most likely to be able to provide the assistance I need" - or words to that effect.

People like to help. It is a compliment to be asked. Just think how you react when people ask you for assistance. It is an ego boost to which most people respond altruistically. "I need your help!" has an echo of chivalry - maidens and dragons and things.

The second phase is where most salesmen get it wrong. They become devious rather than asking for the information they really need. If someone is going to help you they are best fitted to do so if they know exactly what you need and why you want it. It really is an acceptable approach to ask "Can you give me the name of your managing director please. I want to sell him a computer. Do you know if you already have one? Do you have any idea what it is used for, what make it is and who is in charge of it?"

The direct and truthful approach will tend to generate much more information than contrived approaches such as "I am writing a letter to your managing director and... wondered if you could..." "I have been to your company before but I've forgotten..." or even "What's the weather like at your end?"

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## Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth  
**Block 5 (Love Is Just A Block Away)**

While Hex and Cleo are asleep in their hideout high up in the Sierra Nueva, Sheriff Spricket and his deputy meet a sticky end for letting them go free.

When Hex awoke it was already pitch dark and very cold, so cold that he turned on his metabolism booster. He raised himself onto his elbows and tried to look around.

"You all right?" came Cleo's voice out of the night. She had heard him stirring. Hex turned towards the sound. "I'm fine. How are you?" "Freezing."

He realized that she had given him back his greatcoat. "You should have kept this," he said. "It gets pretty cold up here once the sun goes down, and we must have slept all day and half way through the night."

"Some of us must have," said Cleo.

Hex rose and groped towards Ascii's motionless body. Before long Cleo saw two red lights coming toward her. "Let's get back in the tunnel," Hex proposed. "Ascii can warm it up for us."

They hung a makeshift curtain, consisting chiefly of Hex's coat, across the entrance to keep out the draught, then settled down to talk. Hex left Ascii glaring at the wall, lighting it to a dull red glow with the heat of his lasers.

"What we have to do," he announced, "is to find some supporters. On our own we are no match for the System; but if we can find some disgruntled androids to join us we could form a resistance cell."

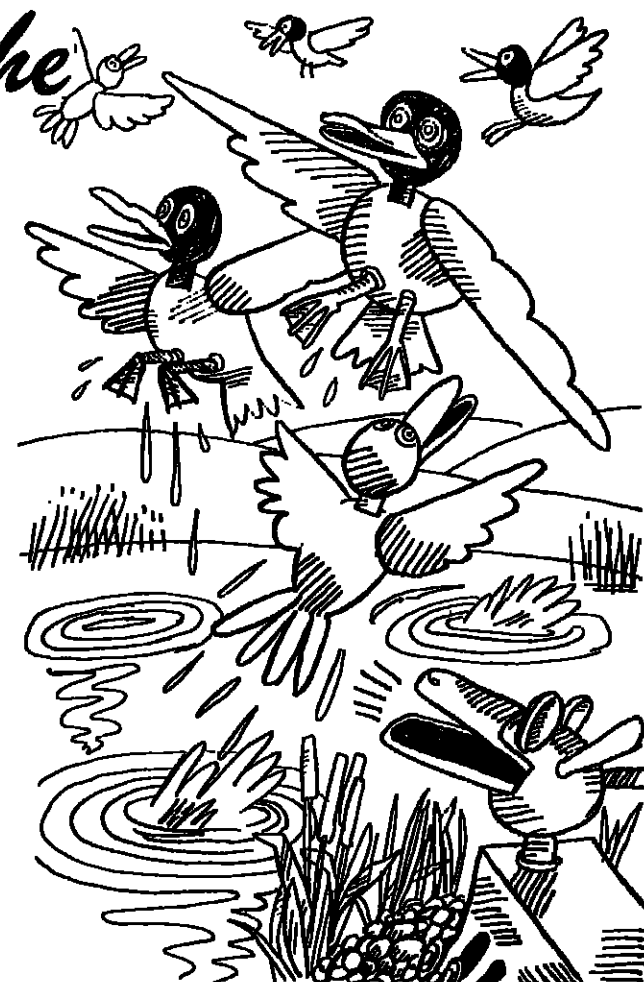
"Well, I know my elder sister Lambda is pretty fed up, and she works at the San Guine research lab which is not too far from here. Why don't we go and get her?"

"We really want androids, who know their way around the System."

"She is an android," was Cleo's indignant reply. "So is her boyfriend, Zap: he's supposed to be a machine-code wizard. But he's always getting into trouble."

"Zap? You don't mean Zap Zapper, the logic bomber?" "I think that's his name."

Hex was truly impressed. "You're talking about the Zap Zapper, telecommunications freak and programmer extraordinary — the one who wrote 'Schizophrenia divides and rules OK,' on the central master accounts file. We could certainly do with someone like that. He's a legend in his own time. I'm surprised he's still at large."



"Well, they've confined him to some menial job — maintaining old Cobol programs, I believe — that's why he is so discontented."

"Great! Do you think they would agree to join us?"

"I'm sure I can persuade Lambda and I have a feeling that if she comes so will he."

"That's settled then," declared Hex with an air of finality. "We set off for San Guine tomorrow night."

"No. Let's go right away. This place gives me the creeps."

Hex peered out through a crack in the awning. It was already growing light. "What? Travel in broad daylight? You must be insane."

"We're on the run, aren't we? So we have to keep moving."

"Yes, but I could use the day to get Ascii really shipshape again. And I want some time to check out the micro-processor which Null gave me. It may have some valuable information stored in it."

"We don't have time. If we just lie back and take it easy they'll catch up with us. We're only a day's march away from Spricket's hide."

"It's all very well for you, but my alpha ratio is approaching 0.9. The critical loading is 0.95 and if it goes above 0.96 my brain will seize up. I wasn't designed for this sort of existence. I'll have to implement some forgetting routines."

"Huh," expostulated Cleo scornfully. "I thought you mechanical men were so superior. I'm glad I never got cybernated."

Stung by this taunt, Hex was about to make an insulting remark about her place in the evolutionary scale when he checked the impulse, realising that they could not afford anger. "Look," he compromised. "I'll just do the very minimum to get Ascii fixed up again and offload some of my temporary files. Then we'll go, even if it's still light."

Cleo agreed without further ado, and he set to work on his bionic dog.

One by one, Hex went through the diagnostic routines, while Cleo watched over his shoulder. When he was finally satisfied that every circuit board was functioning correctly he rolled Ascii outside and asked Cleo to stand clear. He began the cold-start procedure by switching on the power supply and pressing the reload button.

Ascii cocked one ear, sniffed the air and went bounding down towards the pond, where some birds had gathered to wash themselves. With a great squawking the whole flock took to the air and flew off. Ascii stood under the monkey-puzzle tree barking up at a pair which had taken refuge in its branches.

"He looks all right," said Hex. "Now I'll just do a quick file purge and then we'll be ready to go."

Soon they were clambering up the steep tunnel. With a little help from Ascii, pushing at the rear, they emerged at length from their secret resting place, somewhat breathless and very muddy. It was still early morning.

After they had been walking down the hill for a while in silence Cleo asked, apropos of nothing. "What's Simula like?"

"Eh?"

"Simula. What's she like?" Hex was caught off balance. "Well," he began, "she's a block-structured high-level general-purpose compiler producing relocatable object code..."

"No. I mean what does she look like?" "She has blue eyes and blonde hair. She's Scandinavian. Why? It means nothing to you. Why are you so curious?"

"You kept calling her name in your sleep, that's all. It made me interested."

"Let's talk about something else."

Have we heard the last of Simula? Don't bet on it.  
© 1978, Richard Forsyth, RAIL Timeswriting.

## BOOKS

### 'Go out and buy it—today'

Project management in data processing, by Susan Woodbridge, 178 pp. £10.50. Petrocelli/Charter.

FOR those who have read 'The Computer Survival Handbook', Miss Woodbridge's style will be familiar. This latest book is in a more serious vein, but is written in a simple and attractive manner.

Unlike the turgid tomes on the "science" of "management", Miss Woodbridge takes a pragmatic view of the real world of project control. It is easy to see that she has extensive practical experience of her subject, and although paying intelligent attention to the theory of organisation systems, the main emphasis of the book is on day-to-day practical problems and their solutions.

Although many of the points made are plain good sense, this in no way detracts from her value. Miss Woodbridge has a keen understanding of the seemingly trivial elements in the project leadership role which, if ignored, gnaw away and turn into major crises.

The subject matter is aimed primarily at those about to assume responsibility in systems

implementation functions. As such, it succeeds admirably, and should be required reading.

It is liberally, though not excessively, illustrated with comprehensive charts and diagrams. It is also refreshingly peppered with tricks of the trade.

Although the usual subjects are succinctly covered, the author provides other very helpful chapters on

dealing with project delays, trouble-shooting and estimating — all in eminently practical ways. An irresistible example of the unstuffy presentation (dealing with estimating) is: "Intuitive estimating means hefting the specs, seeing which way the wind is blowing, tossing a coin and saying 'two weeks'. At worst it is on a par with studying the entrails of a chicken, at its best

### Clarity, crispness and accuracy

Computer methods for mathematical computations, by G. Forsythe, M. A. Malcolm and C. Moler, 258pp. £12.80. Prentice-Hall International.

THIS book, the authors state, was developed from the courses in numerical methods taught by them in the Universities of Stanford, Waterloo and New Mexico. Part of the material may be covered in a term or the full book over a year.

In one sense the book is a sequel to an earlier publication, written by two of the authors (Forsythe and Moler in 1967); the book is also the last one which contains a contribution by Professor Forsythe (he died in 1972, at the relatively early age of 55).

The material in this book is presented with clarity, crispness and accuracy; at the same time the style is informal and absorbs the reader.

It is well known in schools of mathematics that numerical analysts do not get involved in detailed machine representation of their numbers and computer scientists have nothing to do with numbers! No wonder one famous American mathematician refused to travel in aeroplanes as these were designed (inaccurately) from his point of view) using floating point numbers. The first topic discussed by the authors attacks this problem head on (Chapter 2: 'Floating Point Computa-



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SEAN O'CONNELL

### Develops, expounds theoretical know-how

Information Systems Architecture, by Börje Langefors and Dr Bo Sundgren, 388pp. £16.85. Petrocelli-Charter (available through Van Nostrand).

THE authors (from the University of Stockholm) evidently have considerable theoretical experience in database design, judging from this textbook for students and users of information systems. The book may have suffered unfortunately in translation from Swedish; an impression is given that the translator would not use a simple word where two difficult ones would do. The authors also fall into the error of many numerate people in tending to use formulae to state what could often be more intelligibly expressed in a simple sentence.

The principles of data structures, entities and attributes are lucidly explained and built up to cover the whole of database design; it also clearly illustrates the virtual necessity of ignoring computing requirements when developing an information system.

Normally in books of this sort, a problem is expressed in simple terms, a solution proposed in principle and then expanded with due logical symbolism into a

complete solution. The authors in this case appear to work backwards. Starting with symbolically expressed solutions they proceed to develop problems in outline which they can solve. The whole field is nonetheless comprehensively covered. This book is bound to become a standard work of reference to practitioners of database design. It shows how to develop a complete system for a new user from scratch; but it needs an experienced user to follow it, and give effect to the solutions proposed.

The overall impression is

### Complex study

The Complexity of Computational Problem-Solving, edited by R. S. Anderson and R. P. Brent, 222 pp. £4.70. Prentice-Hall International.

THE title of this book is found rather confusing and the contents also turned out to be unstructured and equally bewildering. "Computational complexity" has become an accepted field of analysis of finding upper and lower bounds (in some national time measure) to various computational algorithms. The book, which consists

of various loosely knit papers, does not deal with this problem at all. The volume is an edited proceedings of the conference (1974) held at the Australian National University on this topic, and as far as I can make out anybody who had something to write home about has done so. Thus, papers on filter designs, linear programming and philosophical treatises on program composition and program comprehension, etc have all been collected in one volume.

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For a free brochure and application form, please contact: Mr. A. J. Bennett, Personnel Officer, 100, The Quadrant, 201 Moorfields Road, London EC1A 3JF.

## Burroughs Software Programmer

**WOKING : £5,225**

Due to internal promotion we have an opportunity for a Software Programmer to take responsibility for, and to develop, a wide range of in-house software utilities.

Candidates with Burroughs experience should ideally have a sound knowledge of Cobol, a working knowledge of Assembler and have worked in a data communications environment.

Company benefits include flextime, free lunches and modern working conditions.

For an application form please contact:



Miss M. Baldock, Personnel Officer  
B.A.T. (U.K. and Export) Ltd.  
Export House, Woking, Surrey  
Telephone: Woking 78111

UNIVERSITY OF BIRMINGHAM  
Faculty of Education  
DEPARTMENT OF CURRICULUM STUDIES

**POST OF RESEARCH FELLOW IN COMPUTER EDUCATION**

Applications are invited from highly qualified persons to undertake a project to develop and evaluate materials for the use of the computer in education. The successful candidate will be responsible for the design, development and evaluation of materials for the use of the computer in education. The successful candidate will be responsible for the design, development and evaluation of materials for the use of the computer in education. The successful candidate will be responsible for the design, development and evaluation of materials for the use of the computer in education.



**PROGRAMMER**  
**£3881-£4214**  
**(inclusive of supplements)**

To join a team developing systems on a 1903T installation running under Code 24. Opportunity for a team person with the right experience to be involved in financial applications using on-line facilities and data advantage.

Applications should be sent to the Director of Finance, PO Box 2, Wirral Metropolitan Borough Council, Wirral, Merseyside, L87 9JF. Closing date 14 July 1978.

## HONG KONG POLYTECHNIC Department of Computing Science

Applications are invited for Principal Lecturer, Senior Lecturer and Lecturer levels for the Department of Computing Science at the Hong Kong Polytechnic. The Department offers courses leading to a Diploma in Computing Studies, a Higher Diploma in Computing Studies and a Higher Diploma in Systems Analysis. A proposal to offer more advanced work leading to an Associateship in Computing Studies is now under consideration.

The Department's own courses are, at present, commercially oriented and emphasis is placed on practical work. Students are required to spend a minimum of 15 weeks in a local DP department as an integral part of their course, in addition to undertaking projects and case study work. From October this year the courses will be offered under a credit-unit system.

The Polytechnic shares computer facilities with the 2 local Universities. Substantial batch processing facilities are available at all 3 campuses and present developments will facilitate the sharing of resources. In addition, at present 100 interactive terminals are available on the Polytechnic's campus, and it is planned that this figure will rise to approximately 300 by 1980/81.

Successful applicants will have expertise in one or more of the following areas: Advanced COBOL, Advanced Systems Analysis, Systems Programming, Real Time Systems, Project Management and Control, Data Base Management Systems, Advanced Management Information Systems and Computer Organisation.

**General Qualification for Appointment**  
Principal Lecturer: (a) a degree or professional qualifications and (b) an advanced specialist qualification or extensive experience in a specialised field, and (c) substantial teaching and industrial/commercial experience, and (d) proven administrative ability.

Senior Lecturer: (a) a degree or professional qualifications, plus recently an advanced specialist qualification, and (b) at least five years professional or industrial/commercial experience or at least three years teaching experience or a suitable combination of professional and teaching experience.

Lecturer: (a) a degree or professional qualifications or at least a Higher Technician qualification in the appropriate field of study, and (b) at least three years professional or industrial/commercial experience or at least three years teaching experience or a suitable combination of professional and teaching experience.

**SALARY SCALES**  
Principal Lecturer HK\$91,240 to HK\$113,340 p.a. by 6 increments  
Senior Lecturer HK\$74,460 to HK\$100,340 p.a. by 6 increments  
Lecturer HK\$40,920 to HK\$173,980 p.a. by 13 increments  
Note: E1 = HK\$68,680 on 16th June 1978  
(Contracting salary will be commensurate with qualifications and experience)

**CONDITIONS OF SERVICE**  
Appointments will be on two-year contracts bearing contract terms initially. Thereafter suitable appointments may be offered further contracts on appropriate terms of service at the discretion of the Polytechnic. Benefits include long leave, travel passages, subsidised accommodation, medical and dental treatment, children's education allowance, and a terminal gratuity equal to 20% of basic salary received over entire contract period.

For further information and further information see prospectus from the General Secretary, Hong Kong Polytechnic, Hung Hom, Kowloon, Hong Kong. Completed application forms should be returned by July 20th, 1978.